AMERICAN SOCIETY FOR TESTING MATERIALS

BULLETIN

260 SOUTH BROAD STREET PHILADELPHIA, PA.

"Promotion of Knowledge of Materials of Engineering and Standardization of Specifications and Methods of Testing"

NUMBER 70 October 31, 1934

Doctor von Schrenk New President

A. C. Fieldner Elected Vice-President

HERMANN VON SCHRENK, Consulting Timber Engineer, St. Louis, Mo., and senior Vice-President of the Society was elected by the Executive Committee to the office of President on October 9 to fill the vacancy caused by the death of W. H. Bassett who passed away on July 21 soon after he took office as head of the Society.

The vacancy created by Doctor von Schrenk's election was filled by the appointment of H. S. Vassar, as senior Vice-President, Mr. Vassar having been elected a vice-president last June.

A. C. Fieldner, Chief Engineer, Experiment Stations Division, U. S. Bureau of Mines, Washington, D. C., has been elected junior Vice-President. No action was taken to fill the unexpired term of Mr. Fieldner as a member of the Executive Committee.

New Officers

The new President, member of the Society since 1903, is a graduate of the following universities: Cornell, 1893, B.S.; Harvard, 1894, A.M.; Washington University, 1898, Ph.D. He was instructor in plant diseases at Washington University, 1896–1903; pathologist, in charge of Mississippi Valley Laboratory, U. S. Department of Agriculture, 1898–1907, and in charge of timber investigations, special agent and chief, Forest Products, Bureau of Forestry, U. S. Department of Agriculture, 1901–1905. He is consulting timber engineer for many railroad systems. Doctor von Schrenk is the author of several books dealing with timber problems and he has presented many technical papers on timber and its preservation.

A.S.T.M. Committees of which the new President is a member include C-5 on Fire Tests of Material and Construction, D-1 on Preservative Coatings for Structural Materials, and D-7 on Timber. Doctor von Schrenk's record of service on D-7 is unequaled in the Society—he has been its chairman since its organization in 1904. He is the representative of the Society on the Committee on Timber, Structural Division, American Society of Civil Engineers, of which committee he is chairman.

He is serving a term as member of the Board of Directors, American Railway Engineering Association and he holds membership in many other societies and clubs.

NEW OFFICERS

HERMANN VON SCHRENK

A. C. FIELDNER

The newly elected vice-president, A. C. Fieldner, member of A.S.T.M. since 1914, was graduated from Ohio State University in 1906, B.S. in Chemical Engineering. After connections with the Denver Gas and Electric Co. and American Zinc and Chemical Co. he entered Government service as fuels chemist, U. S. Geological Survey. Later he was in charge of the fuels chemical laboratory of the Bureau of Mines and of the gas investigations laboratory.

In 1921 he was placed in charge of the Pittsburgh Station and later also became chief chemist of the Bureau of Mines. Since 1927 he has been chief engineer, Experiment Stations Division.

He is a member of several A.S.T.M. committees and has been chairman of Committee D-5 on Coal and Coke since 1920. He is chairman of the Sectional Committee of Classification of Coals sponsored by A.S.T.M., under the procedure of the American Standards Association.

In 1923, Mr. Fieldner was given the degree of Chemical Engineer by Ohio State University and in 1931, it awarded him the Lamme Medal for meritorious accomplishment in engineering.

1935 Annual Meeting and Exhibit

The various committees charged with developing plans for the annual meeting are laying the groundwork for more intensive work which is to follow, to the end that the Society's Thirty-eighth Annual Meeting, Detroit, June 24–28, Book-Cadillac Hotel, will be an outstanding one. The Committee on Papers and Publications, Meetings Committee, headed by Prof. A. E. White and the Detroit District Committee, of which Past-President F. O. Clements is chairman, are all "oiling the machinery" for subsequent efficient functioning.

A strong technical program is being developed and with the opportunities for "outside" activities, such as plant visits, tours, etc., offered by Detroit, members can look forward to an interesting week.

It is planned to hold the Third A.S.T.M. Exhibit of Testing Apparatus and Related Equipment during the week of the annual meeting. Committees of the Society and research laboratories will sponsor displays of special apparatus they have developed and the producers and distributors of commercial apparatus, laboratory supplies, etc., will show the latest developments in their products.

It is probable that, for the first time, the session rooms, registration desk and exhibit will be on the same floor, thus concentrating meeting activities.

Transportation and Maintenance Meeting

Sponsored jointly by the Metropolitan Section, S.A.E., the New Jersey Motor Truck Association and the Newark Chamber of Commerce, a three-day Regional Transportation and Maintenance Meeting will be held at the Hotel Douglas in Newark, N. J., November 8 to 10. A number of the subjects to be discussed will be of considerable interest to many members of A.S.T.M. Morning, afternoon and evening sessions will be held on the first two days of the meeting, and the third will be given over to an inspection of the Newark Airport, and an exhibit of automotive equipment. Subjects to be discussed include the following:

THURSDAY, NOVEMBER 8

Taxation and Regulation as Applied to Highway Transportation—Discussion of Present Trends and Imminent Changes—Major R. F. Britton, Director, National Highway Users Conference; General B. H. Markham, Director, American Petroleum Industries Committee.

Automotive Diesel Operating Data—Records of the London General Omnibus Co.—N. Mitchell, Asiatic Petroleum Co., London.

Operation of the Code in the Trucking Industry—T. V. Rodgers, President, American Trucking Association.

Economical Application of Rates for Movement of Freight by Motor Trucks—F. I. Hardy, Industrial Engineer.

FRIDAY, NOVEMBER 9

Greater Economy in Bus Operation, Including Use of Butane and Propane—William B. Stout.

The New Automotive Fuels—Butane and Propane as Refrigerants and Fuels.

Motion Pictures of Fuel Tests in 1934 Cars on Uniontown Hill. Impartial Tests Conducted by Detonation Subcommittee of the Cooperative Fuel Research Committee—G. J. Liddell, Henry L. Doherty and Co.

Problems of Industry in Using the Highways—G. E. Clinton, Traffic Manager, Sheffield Farms.

Planning and Administering Highway Systems for Greatest Usefulness—W. J. Sloan, Chief Engineer, New Jersey State Highway Department.

Business Utilization of Air Transport Facilities—Economic Maintenance and Safety Features—E. P. Lott, Vice-President, Charge of Operations, National Air Transport Co.

1935 Regional Meeting in Philadelphia

The 1935 Regional Meeting of the Society is to be held in Philadelphia on March 6 and it is to be featured by a technical program devoted to a Symposium on Paint sponsored by Committee D-1 on Preservative Coatings for Structural Materials.

Since March, 1927, there has been no formal Society meeting in Philadelphia. At that time the committees gathered in their Spring Group Meetings. The 1935 Regional Meeting will be the sixth that has been held, previous ones having been in Detroit, Pittsburgh, Cleveland, New York, and Washington.

Group Committee Meetings

It has been customary during recent years to hold the Spring Group Meetings of Committees during the week in which the Regional Meeting is scheduled—and this plan will again be followed in 1935—the various committees, many of which have already planned to convene at that time, holding their sessions from March 4 through March 9. The purpose of devoting several days to committee meetings is, of course, to enable those interested in various committees to attend several different meetings in a short period—conserving expenses and time. Meetings are scheduled to avoid as many conflicts of personnel as possible.

Statistical Applications in Industry

The Joint Committee on the Development of Statistical Applications in Engineering and Manufacturing, organized in 1932, has issued an informal report which should be of interest to many in A.S.T.M. who are following progress in this comparatively new field.

The committee has attempted to broaden the field of application of statistical methods through cooperation with individuals and with committees organized by societies and industries and it has been successful in interesting some very active and energetic men who are applying these methods in their own particular branches of industry.

When an attempt is made to apply modern statistical methods in industry, it becomes evident that their proper application demands a special type of training. That such training might be available, the committee has cooperated with faculty members of several universities interested in organizing courses in the theory of statistics. In at least four schools—Harvard Business School, Massachusetts Institute of Technology, Stanford University and Wharton School of Finance—the general theory of quality control and the application of statistics in engineering and manufacturing has been discussed in certain regular classes.

One of the fields to be investigated first is that of establishing the distribution functions of physical and engineering constants. It is significant, therefore, that within the past year Prof. R. T. Birge of the University of California, an outstanding authority on the best values of physical constants, has entered upon an investigation of the application of modern statistical theory in this field.

The committee has been cooperating with the two similar committees in England and Germany by exchanging publications and other information referring to the spread of the application of statistical methods in industry. The section of the Royal Statistical Society formed to further these applications has had several successful meetings.

Professor Campbell Honored by Committee

Elected Honorary Chairman by Committee B-2 After 25 Years as Chairman

AFTER a period of service as chairman of Committee B-2 on Non-Ferrous Metals and Alloys extending over 25 years, Professor William Campbell has been honored by election to the office of Honorary Chairman. Professor Campbell presented his resignation as chairman at the June meeting, reluctantly compelled to do so because of ill health. In thus paying signal honor to its leader, Committee B-2 adopted the following resolution:

WHEREAS, Professor William Campbell has served Committee B-2 faithfully and well as its chairman ever since its organization; and

WHEREAS, we note with regret that the state of his health has prevented full participation in the activities of the committee for some time, and he has expressed the opinion that he should retire as active chairman;

THEREFORE, BE IT RESOLVED, that a proper minute be placed in the Society's records, gratefully acknowledging the debt which we owe him for his leadership, from which has come so many of the achievements of Committee B-2 and its various offshoots, and

FURTHER BE IT RESOLVED, that in order to avail of Professor Campbell's counsel in the future, the office of Honorary Chairman be established, and that he be asked to accept this post of honor.

Committee B-2 was organized in 1909, including in its personnel individuals who were authorities in the non-ferrous metals field and who have contributed immeasurably to technical progress in this field. Excerpts from letters from certain of these men who have been associated with Doctor Campbell in committee work from the beginning indicate the esteem in which he is held:

"It was really a rather singularly fortunate thing that Doctor Campbell was willing to accept the chairmanship of the newly organized Committee B-2. His freedom from commercial bias and especially his manifest fairness and open-mindedness quickly established him in the confidence of all and greatly aided the building up of the cooperative spirit so essential to committee work, but of equal importance was his sound knowledge of the metallurgy of the non-ferrous metals which, in the metallographic sense, as contrasted with the old sense of the winning of metals from their ores, gave him a background which helped destroy the reluctance to give up the idea of trade secrecy. One may say that Committee B-2 has grown up with the metallurgy of the non-ferrous metals and no little of the progress that has been made is due to the wise guidance and cooperation-inspiring leadership of Doctor Campbell."

"At the time this committee was appointed the field which it was to occupy was practically virgin. But little reliable information was to be found in the literature. Such knowledge as existed was largely confined to the technical staffs of manufacturers and was closely guarded.

"Under the inspiration and leadership of Doctor Campbell such information as was necessary for the proper functioning of the committee was made available. In addition, members of the committee were stimulated to institute and conduct research where necessary to fill up existing gaps. As a consequence the committee has to its credit many accomplishments which merit and receive the confidence of all interests.

"As one who has been in close touch with the work of the committee since its organization, I cannot speak too highly of Doctor Campbell's contribution to the success of its activities. In his election as Honorary Chairman a well-merited honor has been done him."

HONORED

WILLIAM CAMPBELL

Doctor Campbell's education was received in England and this country (Columbia). He won degrees of Doctor of Science and of Philosophy, and in 1929 Columbia honored him by conferring the honorary degree of Doctor of Science. Since 1904 he has been a member of the faculty at Columbia, Howe Professor of Metallurgy from 1914. He was also Metallographer with the U. S. Geological Survey 1908 to 1912, and with the Bureau of Mines 1912 to 1918. He was Commander in the United States Naval Reserve 1919–1929, and on the Honorary Retired List from 1929.

In the Society, Doctor Campbell has not confined his activities to Committee B-2. He served as a member of the A.S.T.M. Executive Committee 1924 to 1926 and at the present time is a member of Committees A-4 on Heat Treatment of Iron and Steel (since 1905), A-5 on Corrosion of Iron and Steel (since 1906) and E-4 on Metallography (since 1916). He has been interested also in the work of a number of other committees.

Doctor Campbell is a member of several societies and clubs in this country, including the American Institute of Mining and Metallurgical Engineers and the American Society for Metals and he is also affiliated with the British Institute of Metals and the Iron and Steel Institute of Great Britain. In 1926, Doctor Campbell presented the Howe Memorial Lecture of the A.I.M.E. on the subject "Twenty-five Years of Metallography."

As would be expected of a man so eminent in his profession, he has presented a number of technical papers and reports before the Society. His outstanding work was the "List of Alloys" which he painstakingly compiled, first published by the Society in 1922 under the sponsorship of Committee B-2, with extensive revisions and amplifications by Doctor Campbell in 1930.

During his notable period of service for Committee B-2, Doctor Campbell has witnessed a remarkable growth and expansion in its work. This committee has the record of being foster parent to three other standing committees—B-5 on Copper and Copper Alloys, Cast and Wrought; B-6 on Die-Cast Metals and Alloys; B-7 on Light Metals and Alloys, Cast and Wrought. These groups were originally subcommittees of B-2, but with the rapid growth of the standardization and research work, it was found desirable to reorganize and expand the subgroups into standing committees.

Some appreciation of the character of Doctor Campbell may be gained from his comments in expressing his gratitude for the honor conferred by his committee: ". . . I am *not* finished and I have *still* a lot of work to do for B-2, some of which I couldn't very well do as chairman." To such men in A.S.T.M. must be credited its outstanding contributions to its chosen field.

American Society for Testing Materials

BULLETIN

President
HERMANN VON SCHRENK

Vice-Presidents
H. S. VASSAR A. C. FIELDNER

Secretary-Treasurer
C. L. WARWICK

Members of Executive Committee
H. A. ANDERSON C. N. FORREST
H. J. BALL L. S. MARSH
F. A. BARBOUR J. C. PEARSON
W. M. BARR J. B. RATHER
A. E. WHITE

Past-Presidents
F. O. CLEMENTS CLOYD M. CHAPMAN T. R. LAWSON

Assistant Treasurer J. K. RITTENHOUSE
Assistant Secretary R. E. HESS

Number 70 **October 31, 1934**

Research

1914 - 1925 - Now

ULTIMATE progress involves a searching, critical, and thorough inquiry and investigation into the facts and principles relating to the subject. Real research lies at the basis of that complete and definite knowledge of the properties and behavior of engineering materials that is so essential in the formulation of specifications for the selection of materials . . . and more and more as time goes on will the Society need to avail itself of the fruits of research. Possibly some day there may need to be a general research committee of the Society to coordinate work and to stimulate opportunities. . . Research requires patience, diligence, and skill as well as knowledge and opportunity, from outlining the problem and separating the essentials from the non-essentials to analyzing the data and drawing conclusions . . . encourage the extension of the work."—*President Arthur N. Talbot, 1914.*

¶ What is our purpose in promoting knowledge of engineering materials? . . . I believe it can best be stated thus: to increase the efficiency and effectiveness of materials of engineering. . . Through research the circle of knowledge is widened. . .

Basic research on engineering materials should be carried on cooperatively by all interests concerned. This not only distributes the costs more equitably, but permits drafting the best available talent which is familiar with both the consumer and the producer sides of the technical and commercial problems involved. This Society provides just these conditions and there is no more appropriate channel through which research work on the fundamental problems of engineering materials can be carried on. . .

In conclusion, I venture to suggest that America's leadership in the industrial world is due not only to efficiency through mass production and the efficient use of men and materials, but also to the application of knowledge made available through research and the cooperative work of scientists, technologists and engineers in industry. . . Let us determine to increase our [the Society's] contribution to the common cause of maintaining America's industrial supremacy by making our work still more useful to industry through more intensive promotion of knowledge of engineering materials by all of the various means at our disposal."—*President F. M. Farmer, 1925.*

¶ *And now,* let each member refer to the Supplement accompanying this BULLETIN. Here is condensed information compiled by Committee E-9 on Research (organized in 1924) that is well worth detailed study.

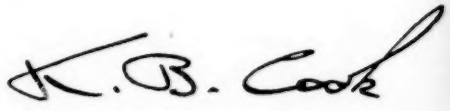
Now Is the Time

NOW is the time that A.S.T.M. members can be of service to the Society—in helping to stimulate membership growth. This work now is of extreme importance. If 25 new members can be obtained in the next six weeks, we can avoid the usual falling off which often characterizes the membership curve during the last quarter of the year. The first nine months of 1934 have offered encouragement—nothing spectacular, but indicative of this outstanding fact—that there are a great many companies and individuals, engineers, technologists, purchasing agents, executives prepared to join A.S.T.M.—*if they are invited.*

No one questions the value of affiliation with the Society—the extensive publications, with new standards, new data and information on technical problems; the associations and contacts that are established, and other assets of membership. But the problem is to acquaint prospective members with these advantages, to sell A.S.T.M.—to the end that they may benefit, the Society's numbers increase with a consequent still wider program of work, and that the products of the Society be put to greater use.

In the Supplement to this BULLETIN is a condensed review of research activities under Society sponsorship. You can use it to advantage.

Let everyone do his part and make a real effort in the *next week* to contact someone who would find A.S.T.M. membership a real benefit.



Chairman, Membership Committee.

P.S.—The following members have secured their new member since the July BULLETIN was published. This gave a list of others in A.S.T.M. who had previously obtained new members.

D. L. Colwell
A. L. Davis
T. G. Delbridge
L. H. Fry
S. M. Phelps
J. B. Rather
G. A. Reinhardt
R. L. Templin

Symposium on Outdoor Weathering

The papers and extensive discussion comprising the Symposium on the Outdoor Weathering of Metals and Metallic Coatings, held as the technical feature of the Washington Regional Meeting, March, have recently been published.

Five technical papers form the basis of the publication, while the interesting and worthwhile discussions on this subject of corrosion enhance the usefulness of the information and data given.

A combined description - order blank for the convenience of members is enclosed with this BULLETIN. This lists the special prices to members.

All Items on Letter Ballot Adopted

The canvass of the recent Society letter ballot showed that all of the items on the ballot were adopted. The recommendations to adopt 37 tentative specifications and test methods as standard and tentative revisions of twelve existing standards thus became official as of September 1.

A complete list of all items on the ballot is given below, with the votes tabulated. There were a total of 501 ballots cast, and the difference between this figure, and the sum of affirmative and negative votes on a particular item represent ballots marked "not voting" for that item. A two-thirds vote of those voting is required for adoption.

Items	Affirmative	Negative
REVISIONS OF EXISTING STANDARDS		
Standard Specifications for:		
Cold-Drawn Steel Wire for Concrete Reinforcement (A 82 – 33)	119	1
Lap-Welded and Seamless Steel and Lap-Welded Iron Boiler Tubes (A 83 – 33)	108	1
Basic Carbonate White Lead (D 81 – 31)	93	1
Chafer Tire Fabrics (D 316 – 33)	36	1
Tolerances for Hose Ducks and Belt Ducks (D 181 – 33)	40	1
Tolerances and Test Methods for Certain Light and Medium Cotton Fabrics (D 274 – 29)	52	1
Standard Methods of:		
Test for Cloud and Pour Points (D 97 – 33)	157	9
Test for Sulfur in Petroleum Oils Heavier than Illuminating Oil (D 129 – 33)	155	2
Abridged Volume Correction Table for Petroleum Oils (D 206 – 25)	158	2
Test for Size of Anthracite (D 310 – 31)	64	0
Testing Electrical Porcelain (D 116 – 30)	45	1
Testing Woven Textile Fabrics (D 39 – 27)	58	1
TENTATIVE STANDARDS TO BE ADOPTED AS STANDARD		
Metallic Materials		
Tentative Specifications for:		
Electric-Resistance-Welded Steel Pipe (A 135 – 32 T)	120	2
Forge-Welded Steel Pipe (A 136 – 32 T)	116	1
Lock-Bar Steel Pipe (A 137 – 32 T)	109	1
Riveted Steel and Wrought-Iron Pipe (A 138 – 32 T)	121	1
Steel for Bridges (A 7 – 33 T)	138	4
Steel for Buildings (A 9 – 33 T)	135	2
Mild Steel Plates (A 10 – 33 T)	140	2
Ferromolybdenum (A 132 – 31 T)	47	1
Ferrotungsten (A 144 – 32 T)	47	1
Low-Carbon Ferromolybdenum (A 145 – 32 T)	47	1
Molybdenum Salts and Compounds (A 146 – 32 T)	45	1
Drawn or Rolled Alloy, 80 per cent Nickel, 20 per cent Chromium, for Electrical Heating Elements (B 82 – 31 T)	48	1
Drawn or Rolled Alloy, 60 per cent Nickel, 15 per cent Chromium, and Balance Iron, for Electrical Heating Elements (B 83 – 31 T)	50	1
Tentative Methods of:		
Analysis of Ferrotungsten and Ferromolybdenum (A 104 – 32 T)	61	1
Test for Determining the Temperature-Resistance Constants of Resistance Alloys (B 84 – 31 T)	47	1
Tentative Definitions of:		
Terms Relating to Magnetic Testing (A 127 – 31 T)	77	1
Non-Metallic Materials		
Tentative Specifications for:		
Concrete Building Brick (C 55 – 33 T)	82	0
Curing Portland-Cement Concrete (C 80 – 31 T)	115	3
Curing Concrete Slabs with Bituminous Coverings (C 81 – 31 T)	110	5
Curing Concrete Slabs with Calcium Chloride Admixture (C 82 – 31 T)	104	7
Curing Portland-Cement Concrete Slabs by Surface Application of Calcium Chloride (C 83 – 31 T)	105	5
Curing Concrete Slabs with Wet Coverings (C 84 – 31 T)	118	1
Gypsum Wall Board (C 36 – 31 T)	37	1
Gypsum Lath (C 37 – 31 T)	38	1
Gypsum Sheathing Board (C 79 – 31 T)	38	1
Spirits of Turpentine (D 13 – 33 T)	89	6
Shellac Varnish (D 359 – 33 T)	84	1
Centrifuged Shellac Varnish (D 360 – 33 T)	83	1
Calcium Chloride (D 98 – 33 T)	101	5
Cotton Rubber-Lined Fire Hose (D 296 – 31 T)	56	2
0.007-in. Cotton Tape (D 335 – 31 T)	45	2
Cotton Goods for Rubber and Pyroxylin Coating (D 334 – 31 T)	43	2
Thermometers for Engler Viscosimeters (D 300 – 30 T)*	145	6
Tentative Methods of:		
Chemical Analysis of Calcium Chloride (D 345 – 32 T)	102	2
Analysis of Roofing Felt for Fiber Composition (D 272 – 29 T)	71	0
Test for Hardness of Rubber (D 314 – 31 T)	56	4
Determining Relative Humidity (D 357 – 31 T)	101	6

* Special letter ballot conducted because of inadvertent omission of this item from original ballot. 329 ballots returned.

Criticism of Proposed Standards

One of the basic principles underlying the development of standards by A.S.T.M. is that *everyone* interested in a standard shall have an opportunity to participate in its promulgation—either by expressing viewpoints in committees and before the Society, presenting data relevant to the subject considered, and in other ways.

During September and October, the tentative standards which were approved at the annual meeting or by Committee E-10 on Standards (see page 6) are edited and published. In order to stimulate comment and criticism these are brought to the attention of trade journals and associations and other organizations interested, and of course, their widespread use in the various phases of production and consumption tend to stimulate comment.

Members of the Society realize that one purpose in issuing proposed standards in tentative form is to elicit constructive criticism and comment of which the standing committees in charge take due cognizance before recommending adoption as a formal standard. Each A.S.T.M. member can be of service by reviewing critically tentative standards in which he or his company is interested or bringing them to the attention of other interested parties, to the end that finally a standard will be adopted which will represent a true consensus of industry, be practical, complete and authoritative. Comments should be forwarded to Society Headquarters.

Notes on Publications

Many of the publications which were on the schedule for 1934 have been issued and excellent progress is reported on those which are to be completed during the remainder of the year. Among those which have been published are the three compilations of A.S.T.M. standards respectively on Coal and Coke, Petroleum Products and Lubricants, and Electrical Insulating Materials. The reports on Quality Standards for Wrought Iron and on Service Characteristics of the Light Metals and Their Alloys have been issued in the form of reprints. These two reports will be included in the 1934 *Proceedings*.

The annual reports of Committee A-5 on Corrosion of Iron and Steel and B-3 on Corrosion of Non-Ferrous Metals and Alloys which will be included in the *Proceedings* have also been published as separate pamphlets. The Symposium on the Outdoor Weathering of Metals and Metallic Coatings which featured the Washington Regional Meeting last March and the extensively revised and amplified report on Significance of Tests of Petroleum Products have also been published.

The 1934 Year Book, issued in August, has been distributed to all members who requested a copy and each member has been furnished with the 1934 Supplement to the Book of Standards containing all standards listed in the adjoining table. Each purchaser of the Book of Standards also has received a copy of the Supplement without charge.

The 1934 Book of Tentative Standards, which is the only volume containing all of the 236 A.S.T.M. tentative standards, is now being compiled and should be ready for distribution in the near future. The 1934 *Proceedings*, which it is estimated will aggregate about 2200 pages as compared with 1900 in both parts of the 1933 *Proceedings*, will be sent to the members late in the year. Editing of the many technical papers and reports and the extensive discussion is progressing satisfactorily.

New Tentative Standards and Many Revisions Approved

By action of Committee E-10 on Standards at its meeting on August 22, 16 new tentative standards were approved and revisions were accepted in 23 existing tentative standards. Revisions were accepted for publication as tentative of 12 A.S.T.M. standards, while action was taken to withdraw five standards.

All new specifications and tests as well as the various revisions will be included in the 1934 *Proceedings*, Part I, and also in the 1934 Book of A.S.T.M. Tentative Standards.

The large number of items acted upon by Committee E-10 is an indication of the increasing importance of this phase of A.S.T.M. standardization procedure enabling, as it does, the publication of new specifications and the issuing of important revisions in the interval between annual meetings.

New Tentative Standards

Tentative Specifications for:

Alloy-Steel Castings for Valves, Flanges and Fittings for Temperatures from 750 to 1100 F. (A 157 – 34 T) *Committee A-1 on Steel*
Seamless Alloy-Steel Pipe for Service at Temperatures from 750 to 1100 F. (A 158 – 34 T) *Committee A-1*
Sheet Copper-Silicon Alloy (B 97 – 34 T) *Committee B-5 on Copper and Copper Alloys*
Copper-Silicon Alloy Plates and Sheets (B 96 – 34 T) *Committee B-5*
Copper-Silicon Alloy Rods, Bars and Shapes (B 98 – 34 T) *Committee B-5*
Fuel Oils (D 396 – 34 T) *Committee D-2 on Petroleum Products*
Emulsified Asphalt (for Coarse Aggregate Plant Mixes) (D 397 – 34 T) *Committee D-4 on Road and Paving Materials*
Emulsified Asphalt (for Retread and Coarse Aggregate Mixes) (D 398 – 34 T) *Committee D-4*
Emulsified Asphalt (Heavy Premix—Summer Grade) (D 399 – 34 T) *Committee D-4*
Emulsified Asphalt (Heavy Premix—Winter Grade) (D 400 – 34 T) *Committee D-4*
Emulsified Asphalt (Quick-Setting) for Penetration and Surface Treatment (D 401 – 34 T) *Committee D-4*
Woolen Yarns (D 403 – 34 T) *Committee D-13 on Textile Materials*
Worsted Yarns (D 404 – 34 T) *Committee D-13*

Tentative Methods of:

Sampling and Testing Structural Clay Tile (C 112 – 34 T) *Committee C-10 on Hollow Masonry Building Units*
Test for Separation of Liquid Asphaltic Products (D 402 – 34 T) *Committee D-4*

Tentative Definitions of:

The Terms Consistency and Plasticity (E 24 – 34 T) *Committee E-1 on Methods of Testing*

Revisions in Existing Tentative Standards

Tentative Specifications for:

Lap-Welded and Seamless Steel Pipe for High-Temperature Service (A 106 – 33 T)
Zinc-Base Alloy Die Castings (B 86 – 33 T)
Load-Bearing Concrete Masonry Units (C 90 – 33 T)
Structural Clay Load-Bearing Wall Tile (C 34 – 33 T)[1]
Structural Clay Non-Load-Bearing Tile (C 56 – 33 T)[1]
Structural Clay Floor Tile (C 57 – 33 T)[1]
Asphalt Roll-Roofing, Surfaced with Powdered Talc (D 224 – 33 T)
Asphalt Roll-Roofing Surfaced with Granular Talc (D 248 – 33 T)
Heavy Weight Asphalt Roll-Roofing and Heavy Weight Asphalt Shingles Surfaced with Mineral Granules (D 249 – 33 T)
Asphalt Roll-Roofing and Asphalt Shingles Surfaced with Mineral Granules (D 225 – 33 T)
Rubber Insulating Tape (D 119 – 32 T)
Insulated Wire and Cable: Class AO, 30 per cent Hevea Rubber Compound (D 27 – 34 T)
Insulated Wire and Cable: Performance Rubber Compound (D 353 – 33 T)
Asbestos Roving (D 375 – 33 T)

[1] Concurrent with the approval of these revised tentative specifications, the respective standard specifications were withdrawn.

Tentative Methods of:

Test for Emulsified Asphalt (D 244 – 33 T)
Testing Untreated Paper Used in Electrical Insulation (D 202 – 33 T)
Testing Laminated Sheet Materials Used in Electrical Insulation (D 229 – 32 T)
Testing Electrical Insulating Materials for Resistance to Impact (D 256 – 32 T)
Test for Abrasion Resistance of Rubber Compounds (D 394 – 34 T)
Testing Grease Wool and Allied Fibers for Scoured Content (D 232 – 25 T)
Verification of Testing Machines (E 4 – 33 T)
Test for Short-Time High-Temperature Tension Tests of Metallic Materials (E 21 – 33 T)
Test for Long-Time (Creep) High-Temperature Tension Tests of Metallic Materials (E 22 – 33 T)

Tentative Revisions of Standard Specifications and Methods

Standard Specifications for:

Structural Steel for Ships (A 131 – 33)
Welded and Seamless Steel Pipe (A 53 – 33)
Carbon-Steel Castings for Valves, Flanges and Fittings for High-Temperature Service (A 95 – 33)
Alloy-Steel Bolting Material for High-Temperature Service (A 96 – 33)
Forged or Rolled Steel Pipe Flanges for High-Temperature Service (A 105 – 33)
Pig Lead (B 29 – 23)[2]
Steam or Valve Bronze Sand Castings (B 61 – 28)
Composition Brass or Ounce Metal Sand Castings (B 62 – 28)
Sand Castings of the Alloy: Copper 88 per cent; Tin 8 per cent; Zinc 4 per cent (B 60 – 28)
Asbestos Yarns (D 299 – 33)
Chafer Tire Fabrics (D 316 – 33)

Standard Methods of:

Testing Molded Materials Used for Electrical Insulation (D 48 – 33)

Withdrawal of Standards

Standard Specifications for:

The Alloy: Copper 88 per cent; Tin 10 per cent; Zinc 2 per cent (B 10 – 18)
Structural Clay Load-Bearing Wall Tile (C 34 – 31)
Structural Clay Fireproofing, Partition and Furring Tile (C 56 – 31)
Structural Clay Floor Tile (C 57 – 31)

Standard Definitions of:

Terms Relating to Structural Clay Tile (C 43 – 31)

[2] Revision in the form of new tentative specifications, to supersede immediately the present standard.

Measurement of Oil in Bulk

As a result of an extended study by one of its committees, the Institution of Petroleum Technologists, London, England, issued a report on "Measurement of Oil in Bulk." There has been a need for an authoritative publication on the subject of the various national fundamental units generally used in the petroleum industry and with the cooperation of the Standards Department of the Board of Trade, National Physical Laboratory, National Bureau of Standards (U.S.) and the International Bureau of Weights and Measures the report was prepared.

In addition to sections dealing with Fundamental Units, Relative Values and Tables of Inter-Relation of Units, there was included an interesting paper on "Historical Notes on the Principal Units of Weights and Measures."

Copies of this publication, in cloth cover, can be obtained from A.S.T.M. Headquarters at 85 cents per copy, postage prepaid. As a service to A.S.T.M. members, there will be announced from time to time publications issued by the I.P.T. The Institution is reciprocating this service and has copies of A.S.T.M. publications of interest to its members, for sale at its offices, Aldine House, Bradford Street, London, W. C. 2.

New Standards in Construction Field

A number of the A.S.T.M. standards adopted this year and many new tentative specifications cover materials entering into construction projects—buildings, highways, dams, pipe lines and other structures.

The importance of using quality materials in construction, especially in the case of the larger projects is acknowledged to be extremely important. Conformity with A.S.T.M. specification requirements is one assurance that materials are acceptable because the rigorous procedure of A.S.T.M. in preparing a specification, or test, results in practical and authoritative standards—quality standards.

The already widespread—and increasing—use of the standardized specifications and tests of the Society bespeaks their industrial importance. The following concise list should be of interest to building code officials, engineers and contractors, architects and others interested in the construction industries.

STANDARD SPECIFICATIONS ADOPTED IN 1934
(These have been previously published as tentative)

METALLIC MATERIALS

Standard Specifications for:
Cold-Drawn Steel Wire for Concrete Reinforcement (A 82-34)
Electric-Resistance-Welded Steel Pipe (A 135 – 34)
Forge-Welded Steel Pipe (A 136 – 34)
Lock-Bar Steel Pipe (A 137 – 34)
Steel for Bridges (A 7 – 34)
Steel for Buildings (A 9 – 34)
Mild Steel Plates (A 10 – 34)

NON-METALLIC MATERIALS

Concrete Building Brick (C 55 – 34)
Curing Portland-Cement Concrete (C 80 – 34)
Curing Portland-Cement Concrete Slabs with Bituminous Coverings (C 81 – 34)
Curing Portland-Cement Concrete Slabs with Calcium Chloride Admixture (C 82 – 34)
Curing Portland-Cement Concrete Slabs by Surface Application of Calcium Chloride (C 83 – 34)
Curing Portland-Cement Concrete Slabs with Wet Coverings (C 84 – 34)
Gypsum Wall Board (C 36 – 34)
Gypsum Lath (C 37 – 34)
Gypsum Sheathing Board (C 79 – 34)
Spirits of Turpentine (D 13 – 34)
Shellac Varnish (D 359 – 34)
Centrifuged Shellac Varnish (D 360 – 34)
Calcium Chloride (D 98 – 34)

NEW TENTATIVE SPECIFICATIONS
(Approved in 1934. Certain of these were issued previously but were extensively revised this year)

METALLIC MATERIALS

Tentative Specifications for:
Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses (A 120 – 34 T)
Wrought-Iron Plates (A 42 – 34 T)
Sheet Copper-Silicon Alloy (B 97 – 34 T)
Copper-Silicon Alloy Plates and Sheets (B 96 – 34 T)
Copper-Silicon Alloy Rods, Bars and Shapes (B 98 – 34 T)
Magnesium-Base Alloy Sheet (B 90 – 34 T)

NON-METALLIC MATERIALS

Tentative Specifications for:
Quicklime for Structural Purposes (C 5 – 34 T)
Hydrated Lime for Structural Purposes (C 6 – 34 T)
Ground Fire Clay (C 105 – 34 T)
Sodium Silicate for Curing Concrete (C 111 – 34 T)
Non-Reinforced Concrete Sewer Pipe (C 14 – 34 T)
Reinforced-Concrete Sewer Pipe (C 75 – 34 T)
Emulsified Asphalt (Coarse Aggregate Plant Mix) (D 397 – 34 T)
Emulsified Asphalt (for Retread and Coarse Aggregate Mixes) (D 398 – 34 T)
Emulsified Asphalt (Heavy Premix—Summer) (D 399 – 34 T)
Emulsified Asphalt (Heavy Premix—Winter Grade) (D 400 – 34 T)
Emulsified Asphalt (Quick-Setting) for Penetration and Surface Treatment (D 401 – 34 T)
Timber Piles (D 25 – 34 T)
Creosote (D 390 – 34 T)
Creosote Coal-Tar Solution (D 391 – 34 T)

Refractories Committee Holds Fiftieth Meeting

The meeting of A.S.T.M. Committee C-8 on Refractories in Pittsburgh on September 19 was the fiftieth held by the committee since its organization in 1914. There was extended discussion of the various standardization and research matters on the committee's program of work and as a result of action taken at the meeting a number of recommendations are being submitted to letter ballot of the committee. Some of these are discussed in the following paragraphs.

Three new specifications are being balloted upon by the whole committee. These include a method of testing refractories to determine permanent linear change after reheating to 1400 C. and holding at that temperature for five hours. This test is widely used in specifications and is considered valuable although results should be interpreted by one well versed in the behavior of refractory materials. The other two specifications cover malleable furnace brick and boiler furnace brick, these being respectively extensive revisions of existing specifications C 63 and C 64. Upon issuance as tentative of the proposed revised specifications, the committee recommends the withdrawal of the existing standards.

A number of research activities were reported upon. A study of methods of determining heat conductivity is under way in order that better agreement can be obtained between different laboratories and recommendations are being drafted for a standard procedure for the petrographic examination of certain types of refractory brick. There was extended discussion of the question of adopting a series of standard pyrometric cones with uniform temperature intervals which would replace those of non-uniform intervals used at present for test purposes. A further study of this matter will be undertaken.

Information Wanted by Joint Committee on Effect of Temperature

"Please list your long- and short-time high-temperature tension testing equipment." Such is the urgent request of the Joint A.S.M.E.-A.S.T.M. Committee on Effect of Temperature on the Properties of Metals. Last year this committee prepared tentative "codes of recommended practice" for the making of short-time high-temperature tension tests (A.S.T.M. Designation: E 21 – 34 T) and long-time or "creep" tests (E 22 – 34 T). Adherence to these principles bids fair to enable different laboratories to secure consistent and reliable results.

The committee would like to have a list of the laboratories which are equipped to make short- and long-time high-temperature tests under code refinements and the number of creep units that come within the code requirement available in each laboratory. It is desired to list in this "census" both the private laboratories of firms handling only the work of those firms themselves and the research laboratories that can handle such tasks for those whose own laboratories are not so equipped. It is desired that apparatus and methods being used for study of the possible future applicability to high-temperature investigations of so-called "accelerated" methods be also listed.

The committee will appreciate the cooperation of all concerned. The information should be sent to the Secretary of the Joint Committee, Mr. N. L. Mochel, Westinghouse Electric and Manufacturing Co., Lester Station, Philadelphia.

Committee D-13 Celebrates Twentieth Anniversary at Successful Meeting

The series of meetings of Committee D-13 on Textile Materials held in New York City on October 17, 18 and 19 are considered among the most successful yet held by this committee. The meeting also celebrated the twentieth anniversary of the organization of the committee. A number of constructive actions were taken at the meeting some of which are indicated in the following paragraphs.

The scope of Section V on Hose, Belt and Numbered Duck of Subcommittee A-1 on Cotton and Its Products has been changed to cover all heavy cotton woven fabrics. Subcommittee A-3 on Wool and Its Products was divided into four sections as follows: Section I on Wool, Section II on Felt, Section III on Wool and Worsted Yarns and Section IV on Woolen Fabrics. The general chairman is Mr. G. E. Hopkins, Technical Director, Bigelow-Sanford Carpet Co., Inc., who is also chairman of Section I. Mr. J. F. Marshall, General Sales Manager, American Felt Co., is chairman of Section II; Mr. Fred Noechel, Head of Textile Laboratory, Botany Worsted Mills, of Section III; and Mr. A. G. Ashcroft, Product Engr., Alexander Smith and Sons Carpet Co., of Section IV.

Based on the reports of the respective subgroups in charge, the following recommendations were accepted at the meeting for submission to letter ballot of the Committee D-13 membership:

Proposed Methods of Testing:

Cotton Fiber Length and Length Distribution
Cotton Fiber Fineness
Cotton Fiber Immaturity Count
Strength of Raw Cotton
Shrinkage in the Laundering of Silk and Rayon Broad Goods

Revisions were recommended in the Standard Specifications for Textile Testing Machines (D 76 – 33). The changes provide for recognition of the constant specimen-rate-of-load machine as an approved type of tensile testing machine; the addition of a tolerance for testing machine speed; omission of reference to alignment pins; prevention of back-lash in dial pointer; and individual strand jaws. In the General Methods of Testing Woven Textile Fabrics (D 39 – 34) a change will be balloted upon by the committee involving a method of determining elongation for which an initial load of 6 oz. is specified, while other loads may be specified for particular materials. The meeting took action to refer to the entire committee for approval a revision in the Tentative Definition of Direction of Twist. The proposed definition is as follows:

A yarn or cord has "S" twist if, when held in a vertical position, the spirals conform in slope to that of the central portion of the letter "S," and "Z" twist if the spirals conform in slope to that of the central portion of the letter "Z."

A number of papers were presented at the general meeting of the committee as follows:

Some Observations from a Study of Wool Flannels, Serges and Gabardines—Prof. Ethel Phelps, University of Minnesota.

Determination of Twist in Single Woolen and Worsted Yarns—Fred Noechel, Botany Worsted Mills.

Measurement of Acceptance or Rejection of Synthetic Fabrics by Pittsburgh Women—Prof. D. R. Craig, University of Pittsburgh.

The Principle of Probability in the Evaluation of Testing Results—Dr. I. J. Saxl, Waypoyset Manufacturing Co.

The committee's research program includes studies of the following: Measurement of thickness; diameter of drums for testing strength of cords; slippage of seams in cloth; shrinkage of silk and rayon cloth; fat determination in woolen materials; chemical tests for floor coverings; yarn standards.

New Committee Officers Elected

As a result of the elections of committee officers which take place in the even years, several new officers have been chosen by a number of A.S.T.M. committees. The men thus honored are listed below:

COMMITTEE A-3 ON CAST IRON.
Vice-Chairman: Willard H. Rother, Metallurgist, Buffalo Foundry and Machine Co., Buffalo, N. Y.
Secretary: Edwin K. Smith, Metallurgist, Electro Metallurgical Co., Chicago, Ill.

COMMITTEE A-5 ON CORROSION OF IRON AND STEEL.
Chairman: F. F. Farnsworth, Outside Plant Engineering, Bell Telephone Laboratories, Inc., New York City.

COMMITTEE A-9 ON FERRO-ALLOYS.
Chairman: Charles McKnight, The International Nickel Co., Inc., New York City.
Vice-Chairman: W. R. Shimer, Metallurgical Engineer, Bethlehem Steel Co., Inc., Bethlehem, Pa.
Secretary: John J. Crowe, Engineer in Charge, Apparatus Research and Development Dept., Air Reduction Sales Co., Jersey City, N. J.

COMMITTEE B-1 ON COPPER WIRE.
Secretary: James H. Foote, Supervising Engineer, Commonwealth and Southern Corp., Jackson, Mich.

COMMITTEE B-6 ON DIE-CAST METALS AND ALLOYS.
Chairman: John R. Townsend, General Development Laboratory, Bell Telephone Laboratories, Inc., New York City.
Vice-Chairman: W. H. Graves, Chief Metallurgist, Packard Motor Car Co., Detroit, Mich.

COMMITTEE B-7 ON LIGHT METALS AND ALLOYS, CAST AND WROUGHT.
Chairman: Sam Tour, Vice-President, Lucius Pitkin, Inc., New York City.
Vice-Chairman: E. H. Dix, Jr., Chief Metallurgist, Aluminum Research Laboratories, Aluminum Company of America, New Kensington, Pa.

COMMITTEE C-7 ON LIME.
Vice-Chairman: Lansing S. Wells, Chief, Lime and Gypsum Products Section, National Bureau of Standards, Washington, D. C.
Secretary: Lee S. Trainor, Chief Engineer, Construction Dept., National Lime Assn., Washington, D. C.

COMMITTEE C-8 ON REFRACTORIES.
Chairman: R. A. Heindl, Chief of Refractories Section, National Bureau of Standards, Washington, D. C.

COMMITTEE D-4 ON ROAD AND PAVING MATERIALS.
Chairman: Malcolm H. Ulman, Assistant Engineer of Materials, Pennsylvania State Highway Dept., Harrisburg, Pa.
First Vice-Chairman: R. L. Morrison, Professor of Highway Engineering and Highway Transport, University of Michigan, Ann Arbor, Mich.

COMMITTEE D-9 ON ELECTRICAL INSULATING MATERIALS.
Chairman: T. Smith Taylor, Professor of Physics, Thistle Physical Laboratory, Washington and Jefferson College, Washington, Pa.
Secretary: E. J. Rutan, Superintendent, Test Bureau, The New York Edison Co., New York City.

COMMITTEE D-11 ON RUBBER PRODUCTS.
Vice-Chairman: C. H. Zieme, Service Engineer, The Republic Rubber Co., Youngstown, Ohio.

COMMITTEE D-19 ON WATER FOR INDUSTRIAL USES.
Temporary Secretary: Ralph E. Hall, Director, Hall Laboratories, Inc., Pittsburgh, Pa.

COMMITTEE E-9 ON RESEARCH.
Chairman: P. H. Bates, Chief, Clay and Silicate Products Division, National Bureau of Standards, Washington, D. C.

Addresses Wanted

Anyone knowing the present address of any of the following members, whose last known addresses are listed below, is asked to notify the Secretary-Treasurer:

FRANCIS B. COYLE, 574 Bergen Ave., Jersey City, N. J.

OLIN D. GRAFF, 19 Sixteenth Ave., Columbus, Ohio.

FRANK R. HALE, Vice-President, Vigo-American Clay Co., 812 S. Fifth St., Terre Haute, Ind.

GEORGE C. MAPELSDEN, 4418 Earnscliffe Ave., Montreal, P. Q., Canada.

WILLIAM E. SALOMON, JR., 703 W. Washington St., Urbana, Illinois.

A.S.A. Approves Standards

Five A.S.T.M. standards have been recently approved by the American Standards Association. The first four items listed below were approved by sectional committees of which the Society is sponsor, while the Standard General Methods of Testing Woven Textile Fabrics were approved under the proprietary standards method.

Standards	Designation A.S.T.M.	A.S.A.
Fire Tests of Building Construction and Materials	C 19 – 33	A2 – 1934
Test for Cloud and Pour Points	D 97 – 34	Z11.5 – 1934
Test for Sulfur in Petroleum Oils by Bomb Method	D 129 – 34	Z11.13 – 1934
Abridged Volume Correction Table	D 206 – 34	Z11.1 – 1934
Testing Woven Textile Fabrics	D 39 – 34	L5 – 1934

Appointments and Representatives

The following Society appointments and representatives are announced:

F. M. Farmer, Vice-President and Chief Engineer, Electrical Testing Laboratories, reappointed A.S.T.M. representative on the Standards Council of the American Standards Association for a term of three years.

R. W. Crum, Director, Highway Research Board, National Research Council, a member of Committee E-9 on Research.

H. W. Gillett, Metallurgist, Battelle Memorial Institute, as the Society's representative on the Division of Engineering and Industrial Research of the National Research Council.

C. L. Hippensteel, Member of Technical Staff, Bell Telephone Laboratories, Inc., J. R. Freeman, Technical Department, American Brass Co., and J. C. Fox, Chief Chemist and Metallurgist, Doehler Die Casting Co., from Committees A-5, B-3 and B-6 respectively, to serve on a Joint Committee with representatives of the Bureau of Standards and the Electroplaters' Society to study exposure tests of plating on the non-ferrous metals.

W. H. Bassett, Jr., Technical Superintendent and Metallurgist, Anaconda Wire and Cable Co., to succeed his father as the Society's representative on the Sectional Committee on Insulated Wire and Cable.

H. C. Jennison, Technical Manager, American Brass Co., to succeed Mr. Bassett, Sr., as representative of Committee B-2 on the Non-Ferrous Metals Division of the Society of Automotive Engineers.

W. R. Webster, Chairman of the Board, Bridgeport Brass Co., and H. C. Jennison, Technical Manager, American Brass Co., appointed to Joint Committee on Trolley Wire Specifications.

C. L. Warwick, Secretary-Treasurer, A.S.T.M., a trustee member of Engineering Index, Inc.

Committee for 1935 Marburg Lecture

The committee which will select the Edgar Marburg lecturer for 1935 has been appointed. Under the rules governing the lecture, this group must consist of a member of the Executive Committee, a member of Committee E-9 on Research and a member of Committee E-6 on Papers and Publications. The personnel, representing the respective committees in the order named, is as follows: T. R. Lawson, *Chairman*, Head, Department of Civil Engineering, Rensselaer Polytechnic Institute; H. W. Gillett, Metallurgist, Battelle Memorial Institute; and R. L. Hallett, Chemist, National Lead Co.

Volume I, Proceedings, Wanted

The Society has an urgent request for a copy of Volume I of the A.S.T.M. *Proceedings*. This volume covers Bulletins No. 1–28 (266 pp.) 1898–1901. If any member of the Society has a copy of the volume and wishes to dispose of it, please communicate with A.S.T.M. Headquarters.

Edward D. Boyer

1858-1934

The death on June 12 of Edward Dayton Boyer removed from Society ranks a loyal and active member. Mr. Boyer had been a member of the Society since 1915 and active for many years in Committee C-1 on Cement. From 1923 to 1925 he was a member of the A.S.T.M. Executive Committee and he served on the New York District Committee.

After graduating from the Philadelphia College of Pharmacy (1877), he became interested in the cement field and before 1900 was responsible for the design and construction of various plants. In 1902 he entered the employ of the Atlas Portland Cement Co., coming to New York in 1914. In 1931 he retired from his position as Technical Service Manager with this company.

As a member of the Technical Problems Committee of the Portland Cement Assn. and, during the War, of its committee on concrete ship construction, he did much to advance the technology of cement and concrete. Mr. Boyer was a former director and president of the American Concrete Institute.

An ardent golf enthusiast, he had arranged the A.S.T.M. tournaments on numerous occasions. His record of service with his company and in the Society is noteworthy. His many friends and associates will cherish the memory of his friendly character and pleasing personality.

Necrology

We announce with regret the death of the following:

Edward J. Brady, Manager, Physical Laboratory, United Gas Improvement Co., Philadelphia, Pa. Member since 1920. Mr. Brady, formerly a member of Committee C-8 on Refractories, lost his life during the fire on the S.S. "Morro Castle."

Mary Violette Dover, Associate Professor of Chemistry, University of Missouri, Columbia, Mo. Member since 1926.

George W. Fuller, Consulting Engineer, New York City. Member since 1914.

Alfred J. Jupp, Vice-President, The Lunkenheimer Co., Cincinnati, Ohio. Member since 1932.

James P. Roe, Metallurgist, Reading Iron Co., Reading, Pa. Member since 1923. Mr. Roe was one of the representatives of his company on Committee A-2 on Wrought Iron.

F. C. Sheldon, President, F. C. Sheldon Slate Co., Granville, N. Y. Member since 1929. Mr. Sheldon was a member of Committee D-16 on Slate.

M. M. O'Shaughnessy, Consulting Engineer, Public Utilities Commission, San Francisco, Calif. Member since 1916. Mr. O'Shaughnessy, for many years city engineer of San Francisco, was in charge of the great Hetch Hetchy water supply system, 167 miles in length, costing about $100,000,000. He died 16 days before the Hetch Hetchy Completion Celebration at which he was appropriately to be honored.

New Members to October 25, 1934

The following 42 members were elected from July 20 to October 25, 1934:

Company Members (9)

EVANS PIPE CO., THE, T. J. Evans, Jr., Vice-President, Uhrichsville, Ohio.
NATIONAL PETROLEUM ASSN., 930 Munsey Bldg., Washington, D. C.
NEWMAN-CROSBY STEEL CORP., S. A. Woodruff, Metallurgist, Dean and Farrel Sts., Pawtucket, R. I.
PALMER CO., THE, C. R. Palmer, President, 26 Clay St., St. Bernard, Ohio.
SHEARMAN CONCRETE PIPE CO., R. S. Lander, President, Box 427, Little Rock, Ark.
SOCONY PAINT PRODUCTS CO., P. L. Lotz, Technical Director, Room 539, 26 Broadway, New York City.
SOUTHERN WOOD PRESERVING CO., J. A. Vaughan, Research Engineer, Station A, Atlanta, Ga.
THIOKOL CORP., Bevis Longstreth, President, Yardville, N. J.
UNITED CARBON CO., George L. Roberts, Assistant Chief Chemist, Box 1475, Charleston, W. Va.

Individual Members (32)

ADAMS, R. G., Assistant Professor of Testing Materials, Massachusetts Institute of Technology, Room 1–214, Cambridge, Mass.
ALTIERI, V. JOSEPH, Chief Chemist, Massachusetts Gas Companies, Rover St., Everett, Mass.
BACON, FREDERIC, Professor of Engineering, University College, Swansea, England.
BUTLER, C. M., Chemical Engineer, Marquette Cement Mfg. Co., Chicago, Ill. For mail: Marquette Cement Mfg. Co., La Salle, Ill.
CAMPION, E. W., General Manager, The Bonney-Floyd Co., Marion Road, Columbus, Ohio.
CHANDLER, W. R., Chief Chemist, Idaho Portland Cement Co., Inkom, Idaho.
CLARK, D. S., Instructor of Mechanical Engineering, California Institute of Technology, Pasadena, Calif.
DOHERTY, J. D., Research Engineer, The Koppers Coal Co., Inc., 1001 Koppers Bldg., Pittsburgh, Pa.
FENSKE, M. R., Associate Professor of Chemical Engineering, Petroleum Refining Laboratory, Pennsylvania State College, State College, Pa.
GRUSE, W. A., Senior Fellow, Mellon Institute of Industrial Research, Pittsburgh, Pa.
HANSEN, J. H., Executive Secretary, Brick Manufacturers Assn. of New York, 1716 Grand Central Terminal, New York City.
HARRINGTON, T. F., City Engineer, Madison, Wis.
HOLZWORTH, E. H., President, Frontier Bronze Corp., 818 Elmwood Ave., Niagara Falls, N. Y.
HOUSEL, W. S., Research Consultant, Michigan State Highway Dept., 1224 East Engineering Building, Ann Arbor, Mich.
JUDKINS, M. F., Chief Engineer, Firthite Division, Firth-Sterling Steel Co., McKeesport, Pa.
LANNERT, FRANK, President, Paragon Die Casting Co., 2701 N. Crawford Ave., Chicago, Ill.
MOORE, J. C., Superintendent, Paint Plant, Sinclair Refining Co., New York City. For mail: Box 516, Marcus Hook, Pa.
NEAVE, D. P. C., General Manager and Secretary, Copper Development Assn., Thames House, Millbank, London, S. W. 1, England.
NOWLIN, G. H., Jr., President, Killarney Smokeless Coal Co., Inc., Lynchburg, Va.
PERRY, A. B., Engineer, Shell Chemical Co., Box 875, Pittsburg, Calif.
RHODES, H. L., Manager, The Chemical and Pigment Co., Inc., St. Helena, Baltimore, Md.
ROLLESTON, P. W., Engineer, Northern Aluminium Co., Ltd., Bush House, Aldwych, London, W. C. 2, England.
SANDBERG, FRED, Jr., Chemist, Republic Oil Refining Co., Texas City, Tex.
SCHELLENS, E. L., Chief Engineer, Norman Bel Geddes and Co., 128 E. Thirty-seventh St., New York City.
SINNICKSON, W. B., Chief Laboratory Inspector, The Port of New York Authority, 999 Westside Ave., Jersey City, N. J.
SPIRE, E., Chef du Service Documentation Technique, Usines Renault, Billancourt, Seine, France.
STADLER, J. G., Chief Chemist, Lehigh Portland Cement Co., Box 306, Iola, Kans.
TURNBULL, E. D., Chemical Engineer, Euston Lead Co., 500 Penn Ave., Scranton, Pz.
VIETÓRISZ, JOSEPH, Chief, Steel Works and Laboratory, Royal Hungarian State's Iron, Steel and Machine Works, Diósgyörvasgyár, Hungary.
WEESNER, C. W., Chief Metallurgist, Sharon Steel Hoop Co., Sharon, Pa. For mail, 558 Oak Knoll Ave., S. E., Warren, Ohio.
WILSON, C. W., Superintendent, Metals Refining Co., Hammond, Ind.
ZAR, M. A., Chief, Service de Aviacion Naval, Cordoba 2257, Buenos Aires, Argentina.

Junior Member (1)

HOLMBERG, M. E., Metallurgist, Box 1377, Oklahoma City, Okla.

Personals

News items concerning the activities of our members will be welcomed for inclusion in this column.

S. C. HOLLISTER, formerly Professor of Structural Engineering at Purdue University, has been appointed Director, School of Civil Engineering, Cornell University, Ithaca.

DR. G. A. BOLE, Research Professor of Ceramic Engineering, Ohio State University, has been appointed Manager of the Edward Orton, Jr., Ceramic Foundation. This Foundation, created by the will of Edward Orton, Jr., has charge of the Standard Pyrometric Cone Co. and the Orton Memorial Laboratory. A.S.T.M. members who are on the board of trustees of the Foundation include E. A. HITCHCOCK, Dean, College of Engineering and Director, Engineering Experiment Station, Ohio State University; ARTHUR S. WATTS, Professor of Ceramic Engineering, Ohio State University; P. H. BATES, Chief, Clay and Silicate Products Division, National Bureau of Standards; JOHN M. MCKINLEY, Vice-President, North American Refractories Co.; ROSS C. PURDY, General Secretary, American Ceramic Society.

Included in those who have been appointed chairmen of technical committees of the American Institute of Electrical Engineers are the following: W. F. DAVIDSON, Director of Research, Brooklyn Edison Co. (Electrophysics); W. B. KOUWENHOVEN, Professor of Electrical Engineering, Johns Hopkins University (Instruments and Measurements); and F. M. FARMER, Vice-President and Chief Engineer, Electrical Testing Laboratories (Research). MR. FARMER has also been appointed to the Edison Medal Committee.

P. H. BATES, Chief, Clay and Silicate Products Division, National Bureau of Standards, Washington, succeeded to the presidency of the American Concrete Institute immediately following a meeting of the Board of Direction of the Institute, June 30, 1934. At that meeting the Board regretfully received the resignation of Arthur R. Lord, Lord and Holinger, Consulting Engineers, Chicago, as President of the Institute. MR. BATES was Senior Vice-President. J. C. PEARSON, Director of Research, Lehigh Portland Cement Co., Allentown, Pa., director from the third geographical district was appointed Vice-President by the Board to fill MR. BATES' unexpired term.

H. O. JEFFRIES, formerly with John Avlon, New York City, is now Research Assistant, Barber Asphalt Co., Maurer, N. J.

O. O. MALLEIS was recently made Manager, Inspection Division, Appalachian Coals, Inc., Cincinnati, Ohio.

J. W. COX, JR., who was President, Sibley Mfg. Co., Augusta, Ga., is now Executive, In Charge of Manufacturing, Iselin-Jefferson Co., New York City.

L. BIENFAIT is now Secretary, Bond voor Materialenkennis, Amsterdam, The Netherlands. He was formerly Director, Testing Lab., Koning & Bienfait, Amsterdam.

H. C. JENNISON, formerly Technical Superintendent, American Brass Co. is now Technical Manager of that company.

M. L. TOWER has been appointed Sales Engineer, A. N. Eaton Metal Products Co., Great Falls, Mont. He was formerly Consulting Engineer, Cedar Rapids, Iowa.

R. W. CARLSON, formerly Research Engineer, University of California, Berkeley, Calif., has been appointed Assistant Professor of Civil Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

J. M. LESSELLS, who was Manager of Engineering, Westinghouse Electric and Manufacturing Co. is a member of the firm, Lessells, Timoshenko & Karelitz, Consulting Engineers, Swarthmore, Pa.

C. E. MCKAY, formerly connected with Industrial X-ray Photography, San Francisco, Calif., is now Engineer, Natomas Company, Natoma, Calif.

R. C. HAIMBAUGH has changed his position from Refrigerator Engineer, Grigsby Grunow Co., Chicago, Ill., to the Atwater Kent Mfg. Co., Philadelphia, Pa.

H. E. MATTHEWS is now Manager, Thermostatic Bimetal Division, General Plate Co., Attleboro, Mass. He was previously Chief Engineer, W. M. Chace Valve Co., Detroit, Mich.

W. R. FULLER, Technical Director, Pratt & Lambert, Inc., has been elected chairman of the Paint and Varnish Division of the American Chemical Society and E. W. BOUGHTON, Manager, Paint Dept., R. T. Vanderbilt & Co., chosen chairman-elect.

A.S.T.M. Research Activities (1933-1934)

A review of the various research projects on which A.S.T.M. committees are engaged

RESEARCH—a continual search for, and the promotion of, new knowledge of engineering materials—is one of the two important objectives of the American Society for Testing Materials, the other being standardization. These activities which go hand-in-hand, since new developments today become the standards of tomorrow, give to the A.S.T.M. a unique position among technical societies.

Without continued research, progress would cease. To supply this new information upon which future standardization may be based is the constant work of A.S.T.M. Committees. The research work of A.S.T.M. Committees in studies of materials and the allied testing field is reviewed annually by Committee E-9 on Research. This review in the form of a summary of the 114 research projects on which A.S.T.M. Committees are at work is given below.

The summary has been divided into two parts. Part I—Research on Properties of Materials, includes 51 active committee projects initiated primarily to extend and amplify the knowledge of the properties of materials; and Part II—Research on Methods of Testing, includes 63 committee projects devoted to methods of testing in connection with which are conducted investigations (sometimes of considerable magnitude) that may lead to the preparation of standard test methods and which are not intended primarily to promote knowledge of materials.

The summary includes information not otherwise generally available, except after laborious reference to reports of 60 research, joint and standing committees. Except for several new investigations not as yet reported upon, reference is made in every case to the latest report on each project. Reports now appearing in preprints prepared for the 1934 annual meeting will be published in the 1934 *Proceedings* which publication should be referred to when the *Proceedings* become available in December.

Part I - Research on Properties of Materials

Corrosion of Ferrous and Non-Ferrous Metals

Atmospheric Corrosion Tests of Uncoated Sheets (Committee A-5).—Exposure tests of bare (uncoated) steel and iron sheets under atmospheric conditions at Pittsburgh, Pa., Fort Sheridan, Ill., and Annapolis, Md.

Tests completed at Pittsburgh in 1923 and at Fort Sheridan in 1928, see *Proceedings*, Vol. 23, Part I, p. 147 (1923); Vol. 28, Part I, p. 152 (1928), respectively. Annapolis tests still in progress; complete record of failures of No. 22 gage sheets reported, see reprint, 1934 Report of Committee A-5.

Atmospheric Corrosion Tests of Galvanized Sheets (Committee A-5).—Comprehensive field corrosion studies at five test locations, representing varying atmospheric conditions, on No. 16 and No. 22 gage sheets both uncoated and galvanized with various weights of zinc coatings. An important purpose of the tests is to correlate results of service with various types of laboratory tests including accelerated tests. Record reported of failures that have taken place at all test locations after 7-yr. exposure, see reprint, 1934 Report of Committee A-5.

Attention is also called to the Symposium on the Outdoor Weathering of Metals and Metallic Coatings held at 1934 Washington Regional Meeting, see reprint pamphlet.

Atmospheric Corrosion Tests of Metallic-Coated Hardware, Structural Shapes, Tubular Goods, Etc. (Committee A-5).—Comprehensive field corrosion studies at five test locations, representing varying atmospheric conditions, on metal products coated with the following 8 types of coatings by commercial operations: Hot-dipped zinc, electrodeposited zinc, sherardized (zinc) applied in gas-heated drum, sherardized (zinc) applied in electrically heated drum, electrodeposited cadmium, hot-dipped aluminum, hot-dipped lead (Amaloy), parkerized. Results of inspections of the specimens of coated hardware, structural shapes, tubular goods at all test locations after 4-yr. exposure reported, see *Proceedings*, Vol. 33, Part I, p. 154 (1933).

Corrosion Tests of Electroplated Coatings (Committee A-5).—An extension of tests of plated coatings on hardware mentioned above. Specimens plated of zinc, cadmium, copper, nickel, chromium or combination of these metals, coatings produced under controlled, defined conditions. Samples exposed in six outdoor locations with parallel laboratory and accelerated exposure tests. For summary of progress of these studies, see *Proceedings*, Vol. 33, Part I, p. 164; also reprint, 1934 Report of Committee A-5.

Field Tests on Wire and Wire Products (Committee A-5).—Comprehensive corrosion studies at 10 test locations, representing varying atmospheric conditions, of wire and wire products, including plain wire, barbed wire, wire strand, farm-field fencing and chain line-fence. Materials to be tested include: Uncoated wire and fencing (both copper-bearing and non-copper-bearing), galvanized wire and fencing, stainless steel wire and fencing, copper-weld wire and fencing, lead-clad wire and fencing, dichromate-treated wire (unfabricated). For details of wire test program, see reprint, 1934 Report of Committee A-5.

Total Immersion Tests on Uncoated Sheets (Committee A-5).—Tests on bare (uncoated) steel and iron sheets totally immersed in acid mine water at Calumet, Pa., in saline water at Annapolis, Md., in city water at Washington, D. C., in sea water at Key West, Fla., Portsmouth, N. H., and Port Arthur, Tex.; also tests in open sea water to determine the effect of corrosion on copper-steel pipe and on steel ship plate, with and without copper, when riveted with rivets of iron and steel with varying copper contents.

Tests completed at Calumet in 1921, at Washington in 1928, and at Annapolis in 1930, see *Proceedings*, Vol. 21, p. 157 (1921); Vol. 28, Part I, p. 160 (1928); Vol. 30, Part I, p. 223 (1930), respectively. All No. 22 gage sheets at Portsmouth and Key West have failed, for detailed record of failures, see *Proceedings*, Vol. 32, Part I, p. 105 (1932); Vol. 33, Part I, p. 144 (1933). For report on No. 16 gage sheets and other tests still in progress, see reprint, 1934 Report of Committee A-5.

Accelerated Corrosion Tests (Committee A-5).—Study of various methods of accelerated corrosion tests, with particular reference to their application to metallic-coated products. Related to the atmospheric corrosion tests mentioned above. See *Proceedings*, Vol. 33, Part I, p. 141 (1933).

Embrittlement of Hot-Dipped Galvanized Structural Steel (Committee A-5).—Investigation of the effect of cold working on the physical properties of structural steel before and after galvanizing by the hot-dipped process, to determine the extent of apparent embrittlement, its cause and remedies therefor. The 1931 report of Subcommittee X on Embrittlement Investigation, *Proceedings*, Vol. 31, Part I, p. 211 (1931) gives history of project with selected bibliography. The 1932 report includes recommended practice for safeguarding against embrittlement of hot-galvanized structural steel products and procedure for detecting embrittlement and official report of investigation in paper by Samuel Epstein, "Embrittlement in Hot-Galvanized Structural Steel," see reprint pamphlet, also *Proceedings*, Vol. 32, Part I, pp. 103, 124, and Part II, p. 293 (1932). For supplementary work in progress see reprint, 1934 Report of Committee A-5.

Corrosion Tests of Stainless Steels (Committee A-10).—Laboratory corrosion tests of stainless steels; at present restricted to four typical stainless steels, namely, (1) 18-per-cent chromium, 8-per-cent nickel alloy; (2) 17-per-cent chromium alloy; (3) 13-per-cent chromium alloy with 0.08 to 0.12-per-cent carbon, anealed at 1300 F., and (4) 13-per-cent chromium alloy with 0.08 to 0.12-per-cent carbon, annealed at 1700 F. and three corrosion tests of the inspection type, namely, the Du Pont acid-immersion test, the Navy Department salt-spray test and the copper-sulfate stain test. Studies completed, for details of test methods, data obtained and discussion of results, see *Proceedings*, Vol, 33, Part I, p. 178 (1933). Further work being undertaken to improve the methods studied, see preprint, 1934 Report of Committee A-10.

Standardization of the Practice of Corrosion-Resistance Testing (Committee B-3).—A study of four corrosion tests: namely, total immersion, alternate immersion, spray and accelerated electrolytic. Six non-ferrous metals tested by a number of cooperating laboratories, each following carefully prescribed methods. Detailed description of procedure for each test, preparation of solutions and specimens, materials used and critical discussion of each test, see *Proceedings*, Vol. 32, Part I, p. 201 (1932).

Atmospheric Corrosion of Non-Ferrous Metals and Alloys (Committee B-3).—Comprehensive field corrosion studies at 9 test locations, representing varying atmospheric conditions, on 24 non-ferrous metals and alloys in the form of rolled sheet or strip. Corrosion over 25-yr. period to be measured. Data reported showing changes in weight and tensile properties after 1 yr. exposure of the 24 non-ferrous metals and alloys; also visual inspection results and meteorological data at test locations during exposure period, see *Proceedings*, Vol. 33, Part I, p. 234 (1933).

Corrosion of Non-Ferrous Metals and Alloys in Liquids — Field Tests (Committee B-3).—Testing in the field, metals in several common solutions under conditions representative of those in use in industrial processes. Metals used are those which may reasonably be expected to prove practicable for use in each process. The four solutions to be used are: NaOH, HCl, NaCl and H_2SO_4. Data reported on 17 metals exposed to sulfuric acid; also progress reported of tests in other liquids, see reprint, 1934 Report of Committee B-3.

Galvanic and Electrolytic Corrosion of Non-Ferrous Metals and Alloys (Committee B-3).—Study of galvanic effects (that is, effect of contact between dissimilar metals upon the rate of corrosion of each) at 9 test locations representing varying atmospheric conditions on galvanic couples of metals, used commercially under conditions of tests, and electrolytic action on couples of metals and alloys in hot water, sea water, NaOH and H_2SO_4. Includes study of stainless steel in contact with various non-ferrous metals. See reprint, 1934 Report of Committee B-3 containing record of corrosion for the first-year period on couple combinations of zinc, aluminum, lead, tin, nickel, copper and mild steel at 9 test locations.

Relative Life of Various Screen Wire Cloths (Committee D-14).—To determine the relative life of the higher-grade screen wire cloths when exposed to various atmospheric agencies such as corrosion and wind, as they exist in different localities and climates, so that purchasers of such material may make an economic selection best suited to their particular conditions. Report of failures after four years' exposure, and analyses of SO_2 contents of atmospheres at test locations reported by G. W. Quick, "Atmospheric Exposure and Laboratory Tests on Non-Ferrous Screen Wire Cloth," see *Proceedings*, Vol, 30, Part I, p. 863 (1930). Progress report, unpublished, made in 1932. Inspection and study of specimens now under way will be reported upon later.

Ferrous and Non-Ferrous Metals, General

Investigation of the Effect of Phosphorus and Sulfur in Steel (Joint Committee).—An investigation by a joint committee under the auspices of eleven national organizations, to study the effect of residual and added sulfur and phosphorus in steels of the following classifications: low-carbon steels, such as rivet steel; medium-carbon structural steels; forging steels; rail steels; and steel castings. Extensive reports presented on the effect of residual sulfur on simple carbon forging steels and on the effect of added phosphorus on low-carbon steels, see preprint, 1934 Report of Joint Committee.

Properties of Die Steels at Elevated Temperatures (Committee A-1).—Studies of properties at elevated temperatures of various types of die steels for die casting non-ferrous alloys and the development of tests for evaluating the tendencies of various steels to "heat check" and erode under conditions prevailing in die-casting processes. Investigation just started, no report available.

Research on Yield Point of Structural Steel (Research Committee).—The committee will consider (1) what is the range of yield point of structural steel (that is, low-carbon, medium-carbon, silicon and nickel steels), due to a number of important factors, when furnished under specifications; and (2) what testing procedure will insure sufficiently correct determination of the yield point at minimum expense. The committee has reported four series of tests on Item (2) dealing mainly with effect of speed of movable head on yield point of structural steel. See *Proceedings*, Vol. 27, Part I, p. 646 (1927); Vol. 28, Part I, p. 105 (1928); Vol. 29, Part I, p. 101 (1929); and Vol. 31, Part I, p. 136 (1931). Report of tests on specimens from structural steel shapes, Vol. 30, Part I, p. 133 (1930), contains data on range in yield point, ratio of yield point to ultimate strength and effect of location of test specimen.

Quality of Wrought Iron (Committee A-2).—A study particularly of the influence of raw material and processes of manufacture on the properties and structural characteristics of wrought iron. Report on Quality Standards of Wrought Iron prepared to bring about a better understanding among users of wrought iron concerning its underlying characteristics, the meaning of test results, and the various factors by which the quality may be judged, see preprint, 1934 Report of Committee A-2.

Correlation of Properties of Iron Castings and Test Bars (Committee A-3).—A study of the relationship of properties of iron castings with the properties of coupons attached to castings and of separately cast test bars. Revised specifications prepared in 1932 for gray-iron castings classifying cast irons in respect to tensile strength. Cooperative study of test bars in connection with these specifications now under way, see preprint, 1934 Report of Committee A-3.

Impact Testing of Cast Iron (Committee A-3).—A study of the various types of single-blow and repeated impact tests, to determine impact values of cast iron and to ascertain the type of test most suitable to determine such values. Extensive data on impact strength and other physical properties obtained on 25 sets of cast-iron test bars reported, see reprint

pamphlet, also *Proceedings*, Vol. 33, Part I, p. 87 (1933). Drop test being studied as valuable measure of resistance of cast iron to repeated impact.

Pig Iron Quality (Joint Committee).—Study as to what constitutes quality or "normality" of pig iron and the development of methods for the evaluation of pig iron qualities. Work to be undertaken by Joint Committee sponsored by the American Foundrymen's Assn., American Institute of Mining and Metallurgical Engrs., Gray Iron Inst., Malleable Iron Research Inst. and A.S.T.M.

Effect of Temperature on the Properties of Metals (Joint Research Committee of A.S.M.E. and A.S.T.M.).—The scope of these investigations includes (1) an accumulation of service data of various metals under extreme temperatures; (2) studies leading to standardization procedure for testing metals at high and low temperatures; and (3) outlining and fostering new research work in this field, giving consideration first to the various metals and alloys intended for high-temperature service in power stations, oil refineries, etc. See report of Joint Committee for 1931, *Proceedings*, Vol. 31, Part I, p. 106 (1931), containing report of Committee III on Projects and Work outlining program.

Tests for short-time and for long-time (creep) high temperature tension tests of metallic materials developed; results of tests and other data in explanation of the test methods reported, see *Proceedings*, Vol. 33, Part I, pp. 996, 1004 and 209 (1933). Report on sponsored research on stainless steels presented in paper by H. C. Cross, "High Temperature Tensile, Creep and Fatigue Properties of Cast and Wrought High and Low Carbon 18 Chromium 8 Nickel Type Steel from Split Heats," *Transactions*, Am. Soc. Mechanical Engrs., July, 1934. Progress report presented containing revisions of high temperature test methods (not preprinted), see *Proceedings*, Vol. 34, Part I (1934).

Attention is also called to the Symposium on Effect of Temperature on the Properties of Metals held at the 1931 annual meeting and sponsored by the Joint A.S.M.E.–A.S.T.M. Research Committee. Symposium published, contains 27 papers with discussion.

Fatigue of Metals (Research Committee).—The broad purpose of the committee is to summarize and correlate the work that various laboratories are doing in connection with the fatigue of metals and to study the relationship between fatigue failure and other strength properties of metals and their atomic and metallographic structure. The committee has prepared abstracts of articles on fatigue of metals under repeated stress appearing in the technical press from July 1, 1928, to June 30, 1930. Consideration being given to method of studying fatigue phenomena by use of "probable damage line" for metals under repeated stress. For a brief statement of the "present status of knowledge and current theory in the field of fatigue of metals" and a "summary of knowledge on corrosion-fatigue and on significance and limitations of fatigue test results," see *Proceedings*, Vol. 30, Part I, p. 259 (1930), Vol. 32, Part I, p. 139 (1932). See also 1933 Edgar Marburg Lecture by H. J. Gough on "Crystalline Structure in Relation to Failure of Metals—Especially by Fatigue," reprint pamphlet, also *Proceedings*, Vol. 33, Part II, p. 3 (1933).

General Study of Properties of Babbitt Metal (Committee B-2).—This project includes determination of physical properties of white-metal bearing alloys in the A.S.T.M. standards; correct pouring temperatures of babbitt metals; effect of ratio of length to diameter in compression testing of babbitt metal; and effect of impurities on the properties of babbitt metal, such as friction, wearing properties, fluidity, brittleness and amount of drossing. Investigation partially completed, active for certain portions. Studies on this subject reported by H. K. Herschmann and J. L. Basil on "Mechanical Properties of White-Metal Bearing Alloys at Different Temperatures," see *Proceedings*, Vol. 32, Part II, p. 536 (1932); by J. N. Kenyon on "The Effect of the Addition of Lead on the Hardness of Certain Tin-Base Bearing Alloys at Elevated Temperatures" and by C. E. Swartz and A. J. Phillips on "A Comparison of Certain White-Metal Bearing Alloys, Particularly at Elevated Temperatures," see *Proceedings*, Vol. 33, Part II, pp. 430 and 416 (1933).

Properties of Copper-Base Alloys in Ingot Form.—A study of the properties of selected compositions of copper-base alloys within composition ranges specified in the A.S.T.M. Tentative Specifications for Copper-Base Alloys in Ingot Form for Sand Castings (B 30 – 32 T). This research is being carried on by a research associate placed at the National Bureau of Standards by the Non-Ferrous Ingot Metal Institute. Committee B-5 is cooperating in this work. Researches reported in paper by H. B. Gardner and C. M. Saeger, Jr., "The Effect of Sulfur and Iron on the Physical Properties of Cast Red Brass (85 Cu, 5 Sn, 5 Zn, 5 Pb)," *Proceedings*, Vol. 33, Part II, p. 448 (1933).

Investigation of Aluminum and Zinc-Base Die-Casting Alloys (Committee B-6).—An extensive investigation of die-casting alloys as to composition, strength, hardness, brittleness and resistance to corrosion; also finishing properties of die castings. Studies cover 13 commercial compositions of aluminum-base alloys produced by 5 plants and on 9 zinc-base alloys as cast by 6 producers. The investigation will supply dependable information on the properties of alloys suitable for die castings and the formulation of specifications based either on the alloys tested or on alloys developed as a result of the investigation. Current progress includes tentative specifications for aluminum-base and zinc-base alloy die castings; also report of inspections of zinc-base die-cast specimens after 4-yr. exposure at 6 outdoor test locations, see preprint, 1934 Report of Committee B-6. Studies also reported on "The Effect of Variations in Aluminum Content on the Strength and Permanence of the A.S.T.M. No. XXIII Zinc Die-Casting Alloy" by E. A. Anderson and G. L. Werley, see supplement to preprint of 1934 Report of Committee B-6.

X-ray Metallography (Committee E-4).—A study of the applications of the X-ray (1) in the location of cavities and cracks and other structural variations in metals (metal radiography); (2) to determine the arrangement of atoms or molecules in crystals, size of grain in crystalline aggregates and the orientation of such crystalline material (X-ray crystallography). Recent work not yet reported upon.

Cement

Compressive Strength Test of Cement Mortars (Committee C-1).—Development of satisfactory commercial test for compressive strength of portland-cement mortars. Comprehensive investigation undertaken on 12 cements by 10 laboratories to study effect on results of refinements in proposed test procedure; relation between standard tension, concrete and plastic mortar strength results; the relative merits of standard Ottawa *versus* graded Ottawa sand for cube tests, to obtain data as basis of possible specification requirements; effect of rate of loading on results, and to secure voids-cement ratio as possible further refinement in test. Extensive data reported and tentative method prepared, see preprint, 1934 Report of Committee C-1.

Particle Size and Specific Surface of Cement (Committee C-1).—Development and studies of apparatus and procedures for determining sub-sieve gradation of particle-size and specific surface of cements. Turbidimeter developed at Cement Reference Laboratory of National Bureau of Standards, see L. A. Wagner, "A Rapid Method for the Determination of the Specific Surface of Portland Cement" *Proceedings*, Vol. 33, Part II, p. 553 (1933). Cooperative studies reported on 4 cements by 25 laboratories of this and other apparatus and methods, see preprint, 1934 Report of Committee C-1. Studies also reported by A. Klein on "The Suspension Turbidimeter for Determination of Specific Surface of Granular Materials," see 1934 preprint. Method developed by Committee C-1 for fineness tests of cement using turbidimeter to be proposed as tentative.

Volume Change and Soundness of Portland Cement (Committee C-1).—To obtain information on (1) volume change of neat cement bars when subjected to various temperatures and storage conditions and (2) the influence of cement on volume change characteristics of neat cement, mortar and concrete, under various conditions of storage. Data reported on item one for 16 commercial cements, see preprint, 1934 Report of Committee C-1. Other studies described in paper by H. F. Gonnerman on "Study of Cement Composition in Relation to Strength, Volume Change, Resistance to Sulfate and to Freezing and Thawing of Mortars and Concrete," see 1934 reprint.

Mineral Aggregates

Research in Mineral Aggregates (Joint Committee).—Correlation of research in mineral aggregates under auspices of the Highway Research Board, National Research Council. Considerable information assembled on the nature of shale and its effect when present in aggregates used in concrete and on coatings of various sorts on aggregates and their effects. Abrasion, hardness and toughness tests are receiving attention, and the significance of flat or elongated particles in aggregates is being considered. The committee is in constant touch with researches throughout the country on accelerated durability tests for aggregates. The standardization of an accelerated test and correlation with service behavior is recognized as a pressing necessity, and the Committee is seeking to encourage coordination in these researches by distributing research outlines to interested agencies. See Report of Joint Committee, *Proceedings*, Highway Research Board, Vol. 12, Part I, p. 265 (1932).

Masonry Materials

Weathering Characteristics of Masonry Materials.—Study of the weathering characteristics of such masonry materials as brick, concrete, hollow masonry building units, slate and building stone.

NOTE.—The work of Committees C-3, C-9, C-10, C-18 and D-16, in the study of weathering characteristics and development of accelerated weathering tests is being coordinated through the Coordinating Committee on Weathering Characteristics. Symposium on Weathering Characteristics of Masonry Materials held in 1931, see *Proceedings*, Vol. 31, Part II, p. 715 (1931).

Concrete

Studies of Designing and Proportioning of Concrete (Committee C-9).—Analyzing the existing data on various theories of preparing concrete mixtures and of developing a recommended procedure for the design or determination of a concrete mixture on the basis of strength and workability. Not yet reported upon.

Studies of Concrete Aggregates (Committee C-9).—A study of the various properties of aggregates for concrete, including soundness, resistance to abrasion, absorption and influence of shape, fineness and soft particles on quality of concrete; also freezing-and-thawing tests. Tests developed for soundness of aggregates and for absorption of aggregates (field and laboratory methods), see *Proceedings*, Vol. 33, Part I, p. 286 (1933).

Deleterious Substances in Concrete (Committee C-9).—A study of the various naturally or accidentally occurring materials in concrete which may affect it deleteriously. See abstract of unpublished paper by C. L. Ford on "Comparison of Standards for Colorimetric Test for Sand," preprint, 1934 Report of Committee C-9. Current studies not yet reported.

Curing of Concrete (Committee C-9).—Coordination and study of results of investigations of the curing of concrete, looking ultimately to recommended methods of practice or specifications for curing. Five specifications adopted for various types of curing concrete. Specifications prepared for sodium silicate for curing. See preprint, 1934 Report of Committee C-9. Present studies include effect on warpage, curing of concrete in structures and test for efficiency of curing material.

Workability of Concrete (Committee C-9).—A study of the significance and methods of determining workability of concrete. See *Proceedings*, Vol. 29, Part I, p. 297 (1929). Recent work not yet reported.

Admixtures in Concrete (Committee C-9).—A general study of admixtures which may be added to concrete for the purpose of improving some of its properties. Progress report, see *Proceedings*, Vol. 29, Part I, p. 305 (1929), containing a summary of manufacturers' data on various commercial admixtures. Recent work not yet reported.

Elastic Properties of Concrete (Committee C-9).—Studies of the elastic properties of concrete of different mixtures at different ages under different conditions of moisture, the effect of different aggregates, a determination of the modulus of elasticity of concrete in tension, establishment of Poisson's ratio, and of the effect of application of loads, type of bearing, sensitivity of measuring devices, etc. See paper by R. E. Davis, H. E. Davis and J. S. Hamilton on "Plastic Flow of Concrete Under Sustained Stress," (not preprinted), see *Proceedings*, Vol. 34, Part II (1934).

Permeability of Concrete (Committee C-9).—Study of the literature followed by studies of various methods and apparatus including the significance of permeability and absorption of concrete and the value of blended cements in reducing permeability. See "A Study of the Permeability of a Few Integrally Waterproofed Concretes" by W. M. Dunagan and G. C. Ernst, preprint, 1934 Report of Committee C-9.

Conditions Affecting Durability of Concrete in Structures (Committee C-9).—Study of the conditions under which concrete has not been durable. It will emphasize the precautions which must be taken to produce good concrete, whether in methods, material or workmanship. Studies of freezing-and-thawing tests. For report on the examination of concrete structures in Ontario and Quebec together with observations and conclusions, see *Proceedings*, Vol. 30, Part I, p. 686 (1930). See paper by B. Kellam on "The Action of Water on Concrete," *Proceedings*, Vol. 33, Part I, p. 289 (1933).

Paint and Paint Materials

Accelerated Tests for Protective Coatings (Committee D-1).—A study of accelerated weathering tests for such protective coatings as house paints, enamels, varnishes and lacquers; also correlation of the results with outdoor exposure tests. Specifications prepared for wood panels used in accelerated weather tests of paints and varnishes, see *Proceedings*, Vol. 33, Part I, pp. 319, 745 (1933). Consideration being given to specifications for other wood panels for paint exposure tests. Cooperative program of accelerated weather tests on varnishes and lacquers being completed, see preprint, 1934 Report of Committee D-1.

Anti-Corrosive and Anti-Fouling Paints (Committee D-1).—Study of the value of various anti-corrosive and anti-fouling paints. Report on two series of tests, see *Proceedings*, Vol. 27, Part I, p. 430 (1927). Further studies will include exposure tests in tropical waters. As a result of investigations, standard specifications for the toxic ingredients in anti-fouling paints, and standard methods of routine analysis of dry cuprous oxide and of dry mercuric oxide were developed, see 1933 Book of A.S.T.M. Standards, Part II, pp. 530, 553 and 558. Information on underwater exposure tests of marine paints containing a tung oil vehicle presented in a paper before Paint and Varnish Division of American Chemical Society, March, 1934.

Physical Properties of Paint Materials (Committee D-1).—Study of the physical properties connected with paints and paint materials. Viscosity and plasticity of paints, color and optical properties of paints and paint materials have first been considered. Methods of analysis for the color characteristics of paints adopted, see 1933 Book of A.S.T.M. Standards, Part II, p. 731. Planning detailed study of methods for determining gloss. See *Proceedings*, Vol. 33, Part I, p. 323 (1933).

Study of Hiding Power and Tinting Strength of Paint Pigments and Paints (Committee D-1).—Scope of investigation covered by title. See "Report of Cooperative Work on the Determination of Hiding Power of Wet Paints," and method of test for comparative hiding power of paints, *Proceedings*, Vol. 32, Part I, pp. 386 and 745 (1932). Test procedures developed for tinting strength of white pigments and pastes and for mass color and tinting strength of dry color pigments and pastes. See preprint, 1934 Report of Committee D-1. See also discussion on tinting strength, preprints of 1934 papers by J. W. Ayers on "A Discussion of the Accuracy and Utility of Methods of Test for Mass Color and Tinting Strength of Dry Color Pigments"; G. F. A. Stutz on "The Tinting Strength of White Pigments"; and R. H. Sawyer on "Tinting Strength of White Pigments."

Rubber Products

Abrasion Test for Rubber Products (Committee D-11).—Consideration of abrasion tests for application to those rubber products where abrasion in service is the most important element in determining the life of the material, such as conveyor belting, automobile tires, rubber-covered air and water hose, rubber heels, etc. Procedures covering the six most widely used tests for abrasion resistance of rubber compounds issued as tentative, see preprint, 1934 Report of Committee D-11.

Life Test for Rubber Products (Committee D-11).—Accelerated aging test of various types of rubber compounds in comparison with natural aging of the same samples. Extensive tests completed, results reported on check tests by 13 laboratories, see *Proceedings*, Vol. 33, Part I, p. 412 (1933).

Dynamic Fatigue Testing for Rubber Products (Committee D-11).—To study the general field indicated in title and particularly as applied to repeated extension, bending and similar tests. Studying separation tests on plied rubber and fabric materials; also methods of flex testing rubber stock without fabric. See *Proceedings*, Vol. 32, Part I, p. 481 (1932).

Vibration Absorption of Rubber Products (Committee D-11).—Study, development and standardization of methods of test which are particularly suitable in the evaluation of rubber stocks for shackles, motor supports, bumpers and shock insulators. Studying effect of repeated compression on rubber compounds and flow properties of rubber. Tentative method of test for compression set of rubber used for vibration absorption developed, see preprint, 1934 Report of Committee D-11.

Adhesion of Rubber to Metal (Committee D-11).—Study, development and standardization of methods for measuring the adhesive strength of rubber to metal with particular reference to such applications in the automotive industries. Suggested procedure described by A. H. Flower and H. E. Wening in paper on "Proposed Method for Testing Adhesion of Rubber to Metal" (not preprinted), see *Proceedings*, Vol. 34, Part I (1934).

Properties of Rubber and Rubber-Like Materials in Liquids (Committee D-11).—Study of volume changes of rubber compounds when subjected to the action of oils or various solvents and the development of suitable test methods for comparing the swelling properties. Studies of "The Testing of Rubber and Rubber-Like Materials for Oil Resistance" by O. M. Hayden described in 1934 paper, see preprint.

Part II - Research on Methods of Testing

Ferrous and Non-Ferrous Metals

Alternating Current Tests of Magnetic Materials at Low Inductions (Committee A-6).—Tests of magnetic materials used in apparatus operating at high frequencies (audio frequencies) and low inductions such as core materials for audio-frequency transformers, chokes, etc. Procedures adopted for alternating-current permeability and core loss of magnetic materials at low inductions, see 1933 Book of Standards, Part I, p. 396.

Tests at High Magnetizing Forces (Committee A-6).—Development of test methods operating at high magnetizing forces in order to test materials such as the new high-cobalt steels. New apparatus for testing at high magnetizing forces being developed and studied, see *Proceedings*, Vol. 33, Part I, p. 173 (1933).

Life Test for Durability of Electrical-Resistance Wire at High Temperatures (Committee B-4).—To arrive at the best methods for determining the durability of resistance wire at high temperatures with due regard to service conditions. Standard accelerated life test adopted in 1933. Comparative laboratory tests just undertaken on 80 per cent nickel, 20 per cent chromium wire at temperatures of 1950, 2000 and 2050 F. See preprint, 1934 Report of Committee B-4.

Electrical Tests of Heating and Resistance Alloys (Committee B-4).—Studies of methods of test for thermoelectric power of materials and for temperature coefficient of resistance are being carried on. Tests developed for thermoelectric power, resistivity of, change of resistance with temperature, and temperature-resistance constants of resistance alloys, see 1933 Book of Standards, Part I, pp. 895, 892, 888. Test being developed for temperature coefficient of sheet resistance material (manganin), see preprint, 1934 Report of Committee B-4.

Elastic Properties of Electrical-Resistance Alloys (Committee B-4).—A study of the elastic properties of electrical-heating, electric-resistance and electric-furnace alloys at temperatures up to 1000 C. A study is being made of a special bend test described by Howard Scott "High-Temperature Characteristics of Metals Revealed by Bending," *Proceedings*, Vol. 31, Part II, p. 129 (1931).

Mechanical Tests of Heating and Resistance Alloys (Committee B-4).—Investigations of a test for uniformity of temper of wire by means of stretch of a helical coil, see preprint, 1934 Report of Committee B-4.

Studies of Heating and Resistance Alloys at High Temperatures (Committee B-4).—Tests for thermal conductivity, tests for thermal coefficient of linear expansion, and a study of warpage to determine its relation to thermal expansion and heat conductivity. Test developed for linear expansion of metals, see preprint, 1934 Report of Committee B-4.

Tests for Evaluating Thermostatic Metals (Committee B-4).—Survey of methods of tests for "thermoflex materials;" also preparation of units and definitions of terms used in connection with the specifying and testing of these metals. See preprint, 1934 Report of Committee B-4.

Thermal Analysis of Metals (Committee E-4).—Study of thermal analysis of metals, including methods of testing. Recommended practice for thermal analysis of steel adopted, see 1933 Book of Standards, Part I, p. 931.

Lime

Determination of Soundness of Lime (Committee C-7).—A study of a new method for determining soundness of lime particularly adapted to lime used for plastering. Experimental work at National Bureau of Standards resulted in perfection of autoclave test for soundness of lime issued as tentative method, see preprint, 1934 Report of Committee C-7.

Determination of Plasticity of Hydrated Lime (Committee C-7).—Further investigative study of Society's method for determining the plasticity of hydrated lime. Improved test procedure issued as tentative, see preprint, 1934 Report of Committee C-7.

Gypsum

Consistency of Gypsum Plaster (Committee C-11).—To determine the suitability of the Vicat apparatus and the present standard procedure used for neat gypsum plaster for determining the consistency of gypsum ready-sanded and gypsum wood-fibered plasters. Revised methods of testing gypsum adopted, see 1933 Book of Standards, Part II, p. 96.

Time of Set of Gypsum Neat Plaster (Committee C-11).—A study to determine whether the use of a positive accelerator of constant composition used without sand in determination of time of set of gypsum neat plaster is to be preferred to the present method which employs standard testing sand. See *Proceedings*, Vol. 31, Part I, p. 436 (1931).

Volume Changes in Neat Gypsum and Gypsum Fiber Concrete (Committee C-11).—Study of methods for determination of volumetric changes in neat gypsum and gypsum fiber concrete under varying temperature and humidity changes. No report.

Sand Content of Set Gypsum Plaster (Committee C-11).—Investigation of the method for determining sand content of set gypsum plaster by the use of sodium chloride solution. See *Proceedings*, Vol. 31, Part I, p. 436 (1931).

Refractories

Abrasion of Refractories at High Temperatures (Committee C-8).—Substantially as stated by title. Fire-clay brick manufactured by several different processes as well as standard silica, magnesite and chrome refractories have been tested at room temperatures and at 1000 C. and 1350 C. See *Proceedings*, Vol. 31, Part I, p. 312 (1931).

Load Test of Refractories (Committee C-8).—A study of variables encountered in performing the load test on refractories at elevated temperatures. Survey of various furnaces and their operating conditions under way, data being collected. See preprint, 1934 Report of Committee C-8.

Cold Crushing of Fire-Clay Brick (Committee C-8).—Investigation of crushing strength of fire-clay brick in three directions, namely, flat, on edge and endwise, to obtain data for developing a cold crushing test. Flexural strength and porosity also determined in order to study what relation, if any, exists between these properties. See *Proceedings*, Vol. 30, Part I, p. 476 (1930). Recent work not yet reported.

Pyrometric Cone Equivalent (P.C.E.) Test for Refractories (Committee C-8).—Investigation of uniformity and dependability of P.C.E. results obtained with air-gas, oxygen-acetylene and gran-annular carbon resistance furnaces in order to standardize the furnace for making P.C.E. determinations. Study being made of rate of heating in P.C.E. test, and on variations in sizes of pyrometric cones. For discussion of P.C.E. *versus* Fusion Point by F. A. Harvey, see preprint, 1934 Report of Committee C-8.

Service Spalling Test of Refractories (Committee C-8).—Study of a service spalling test for refractories that will measure resistance to a variety of factors causing spalling, such as vitrification produced by time, temperature and slag coatings and to learn the effect of varying the temperature and rate of cooling. Panel test methods for resistance of refractory brick to thermal and structural spalling issued as tentative, see preprint, 1934 Report of Committee C-8.

Microstructure and Petrographic Studies of Refractories (Committee C-8).—Preparation of recommendations for standard procedure in the petrographic examination of certain types of refractory brick, to include selection and preparation of samples, examination for grain size, form of silica present and similar observations and evaluation of type of examination. Investigation just started, see *Proceedings*, Vol. 33, Part I, p. 284 (1933).

Heat Transfer of Refractory Materials (Committee C-8).—Study of methods of determining and of expressing thermal conductivity. Studies will be made not only on high-temperature refractories but also on materials commonly classed as heat insulators. To formulate standards to measure the different physical properties of refractory heat insulating materials in addition to their characteristic property of retarded heat transfer. Methods of testing high-temperature heat insulation developed, see *Proceedings*, Vol. 33, Part I, p. 279 (1933). Critical study of test methods now being made. Symbols for heat transmission issued as tentative, see preprint, 1934 Report of Committee C-8.

Concrete

Methods of Analyzing Concrete (Committee C-9).—Development of test methods for the quantitative determination of the constituents of concrete. Tentative method developed for routine analysis of the cement content of hardened concrete. Proposed draft of Dunagan method of field determination of the constituents of fresh concrete published as information, see *Proceedings*, Vol. 31, Part I, pp. 362, 383 (1931). See also paper by H. R. Nettles and J. M. Holme "A Study of the Analysis of Fresh Concrete with the Dunagan Buoyancy Apparatus," *Proceedings*, Vol. 33, Part I, p. 297 (1933).

Field Tests for Concrete (Committee C-9).—Standardization of methods of making field specimens, including sampling of the concrete when soft, the methods of sampling hardened concrete, and the development of field tests for concrete. Study of relation between the strengths of test specimens of different forms and dimensions. Relation between the compressive strength of test cylinders made in accordance with the A.S.T.M. standard method and prisms removed from slabs of the same mix. Methods of testing vibrated concrete and an accelerated compression test being studied. Tentative method of transverse testing developed. Recent work not yet reported.

Protective Coatings

Properties and Tests of Varnishes (Committee D-1).—Studies of the physical and chemical properties of varnishes and the development and standardizing of methods of test for determining acid values, for alkali resistance, for skinning, and an adhesion test. Studies of test for alkali resistance reported, see preprint, 1934 Report of Committee D-1.

Naval Stores (Rosin)

Properties and Tests for Rosin (Committee D-17).—Study, development and standardization of following tests for rosin: viscosity, crystallization, size-making value and alum test, acid and saponification number, unsaponifiable matter, and darkening and volatile matter upon heating. Results of cooperative series of viscosity tests reported together with proposed draft of methods of testing rosin published as information, see *Proceedings*, Vol. 33, Part I, p. 435 (1933). Study of methods for determining crystallization tendency of rosin reported, see preprint, 1934 Report of Committee D-17.

Petroleum Products and Lubricants

Melting Point of Grease (Committee D-2).—The pressure-flow relationship of greases at various temperatures, approaching what is commonly known as the melting point, is being studied. Not yet reported upon.

Oxidation at High Temperatures (Committee D-2).—Study of a high-temperature oxidation test whose function is to produce in an oil, as rapidly as possible, changes of the same kind as would normally take place during long periods of actual service. Study of reproducibility of Sligh oxidation test. Two series of tests already carried out with the Sligh oxidation equipment (see *Proceedings*, Vol. 28, Part I, p. 457 (1928)). Report on present studies not yet available.

Classification of Transmission Lubricants and Automotive Greases (Committee D-2).—An attempt is being made to determine the relationship between viscosity of transmission lubricants under pressure and gear shifting in cold weather; also classification of automotive greases based upon consistency and viscosity of mineral oil content. No report available.

Evaluation of Crude Petroleum (Committee D-2).—Study and development of apparatus and procedures for the more or less complete evaluation of crude petroleum. Determination of gravity of crude petroleum on dry (water-free) basis. Not yet reported upon.

Flash Point (Committee D-2).—Consideration is being given to the determination of a flash point method for viscous liquids, especially cut-back asphalts and suspensions of solids. Proposed modification of standard test for flash point by means of Pensky-Martens closed tester developed, see preprint, 1934 Report of Committee D-2.

Corrosion Tests for Lubricating Oils (Committee D-2).—Substantially as covered by title. Various corrosion tests on different types of lubricants being investigated. No report available.

Gum in Gasoline (Committee D-2).—Investigative study of determining gum in gasoline by various methods and behavior of fuels in service; also the gum stability of gasoline. Apparatus and procedure for gum content of gasoline developed. Work on gum stability recently undertaken includes studies of various bomb tests and the copper dish method. See preprint, 1934 Report of Committee D-2.

Vapor Lock of Motor Fuels (Committee D-2).—Study of vapor-locking characteristics of motor fuels. An attempt being made to correlate data obtained by method of test for vapor pressure of natural gasoline (Reid method) with vapor-locking characteristics. See preprint, 1934 Report of Committee D-2; also papers by G. G. Brown on "Motor Fuels and Vapor Lock" and by T. A. Boyd on "Motors and Fuel Vapor Pressure," issued as separate preprints.

Bituminous Materials

Method of Separation of Cut-Back Asphalt (Committee D-4).—Studies of various methods for the separation of cut-back asphalts to determine the amount and character of the base and cut-back. Extensive investigations included studies of atmospheric distillation, steam distillation and vacuum distillation methods. Tentative test for separation of liquid asphaltic products developed, see preprint, 1934 Report of Committee D-4.

Tests of Bituminous Emulsions (Committees D-4 and D-8).—Investigations of testing methods for bituminous emulsions for use on roads and also emulsions used for waterproofing generally, whether vertical or horizontal, and with or without membranes. General test procedures issued as tentative, additional procedures being developed for pliability, resistance to flow under heat, retention of adhesion and cohesion of emulsions when immersed in water. See preprints, 1934 Reports of Committees D-4 and D-8.

Accelerated Weathering Tests of Bituminous Roofing Materials (Committee D-8).—Study of an electrical accelerated weathering test applicable to roofing. Information on radiant energy of alternating-current lamps and direct-current lamps reported; also proposed draft of an accelerated weathering test for bituminous materials published as information, see *Proceedings*, Vol. 33, Part I, pp. 379, 381 (1933).

Tests of Bituminous Joint Compounds for Sewer Pipe (Committee D-8).—Substantially as covered by title. Consideration being given to pressure tests and methods for determining solvent action of sewage on bituminous sewer joint compounds. Work being carried on at University of Illinois, see paper by J. S. Crandell on "Bituminous Joint Compounds for Sewer Pipe."

Timber

Moisture in Timber (Committee D-7).—Consideration of methods for making two types of moisture determinations applicable to timber, the first an accurate method for laboratory use and the second a method sufficiently accurate and practical for field use. Proposed draft of method for determination of moisture in timber for use in the laboratory published as information, *Proceedings*, Vol. 29, Part I, p. 422 (1929). Study made of application of electrical measurements to heavy timber, see *Proceedings*, Vol. 33, Part I, p. 362 (1933).

Coal and Coke

Sampling of and Tolerances for Coal (Committee D-5).—A series of sampling experiments to test the accuracy of the present standard method of collecting and reducing gross samples of coal. Experiments will consist of both hand and machine sampling methods and will be made on a number of different coals varying in size, and containing different amounts of impurities. Not yet reported upon.

Agglutinating Value of Coal (Committee D-5).—Study of laboratory test for obtaining information regarding the coking and caking properties of coal. Proposed draft of a method which is an approximate measure of that material in coal which fuses and becomes plastic on heating published as information, see preprint, 1934 Report of Committee D-5. Method based on experimental work by W. A. Selvig, B. B. Beattie and J. B. Clelland described in paper on "Agglutinating-Value Test for Coal," see *Proceedings*, Vol. 33, Part II, p. 741 (1933).

Pulverizing Characteristics of Coal (Committee D-5).—Investigation of laboratory methods to determine comparative pulverizing characteristics of different coals in connection with their commercial pulverization as powdered coal. Coal grindability tests at 6 laboratories, using 3 ball-mill methods and one special test being made on a series of 5 coals, varying from a friable semibituminous to a hard anthracite, see preprint, 1934 Report of Committee D-5.

Friability of Coal (Committee D-5).—Investigation of method for determining resistance of coal to breakage on handling. Experimental data being accumulated using shatter test methods and a laboratory jar method, see preprint, 1934 Report of Committee D-5.

Slacking Properties of Coal (Committee D-5).—Study of method for measuring the extent to which coals may disintegrate when exposed to the weather. Experimental work underway on U. S. Bureau of Mines method, see preprint, 1934 Report of Committee D-5.

Electrical Insulating Materials

Tests of Insulating Varnishes (Committee D-9).—Investigation and development of the following methods for varnish films: Hardness and oil resistance; acid and alkali resistance; and insulation resistance. See preprint, 1934 Report of Committee D-9.

Tests of Saturant Varnishes (Committee D-9).—Studies of properties of saturant varnishes, such as, impregnation, internal drying, bonding strength, and dielectric strength when the varnish is used as an impregnating medium in cotton fabrics. Work recently undertaken, not yet reported upon.

Tests of Molded Insulating Materials (Committee D-9).—Investigation of methods of measuring impact fatigue of molded phenol plastics, and studies of dimensional tolerances suitable for phenol plastic impact test specimens and of the effect of moisture content on impact and transverse strength of phenol plastic test specimens. Investigation of the effect of the type of mold used on the physical strengths of plastic molded test specimens. Also tests for density and particle size of molding powders and plasticity and cure tests. Improvements in impact specimens prepared; also methods of testing molding powders used in manufacturing molded electrical insulators developed, see preprint, 1934 Report of Committee D-9.

Tests of Insulating Papers and Fabrics (Committee D-9).—Investigation and development of methods and apparatus for testing insulating papers, as follows: Procedure for measuring thickness; instruments for determining tearing strength and folding endurance; tests for moisture in impregnated cable paper; acidity tests; air resistance of insulating paper and effect of humidity on dielectric strength of varnished cambric. Methods for thickness and folding endurance developed also specifications and tests for varnished cloth tape and flexible tubing, see preprint, 1934 Report of Committee D-9.

Tests of Insulating Sheets, Tubes and Rods (Committee D-9).—The following studies of laminated sheet insulating materials are being conducted: Method for determining compressibility as a function of time; methods of measuring the modulus of elasticity in compression; the effect of temperature variations on water absorption; effect of humidity on dielectric strength and on flexural strength; impact fatigue tests, arc resistance, hardness tests, punching quality and insulation resistance tests; also methods of test for flammability and heat resistance. Indentation hardness test using Rockwell tester developed. For current progress see preprint, 1934 Report of Committee D-9.

Tests of Liquid Insulation (Committee D-9).—Development of tests primarily applicable to circuit breaker oils, such as the determination of gas formed during arc-over, measurement of carbon formed and precipitated during arc-over, and a test for amount of water precipitated or emulsified during arc-over; also low-temperature viscosities. Studies of the following tests of insulating oils: Neutralization value of both new and used oils; resistance of insulating oils to oxidation (sludge tests), tests for moisture content and for saponification value. Consideration being given to tests for cable oils. Methods for sampling both used and unused insulating oils adopted. Progress reported of work on neutralization number and sludge tests, see *Proceedings*, Vol. 33, Part I, p. 400 (1933); also preprint, 1934 Report of Committee D-9.

Tests of Insulating Compounds (Committee D-9).—Investigation of methods of test for solid filling and treating compounds used for electrical insulation, including: Coefficient of expansion; determination of insulation-resistance temperature characteristics; specimens and tests for dielectric strength; also viscosity tests of high melting asphaltic compounds. Procedures developed for measuring coefficient of expansion and for power factor and dielectric strength, see preprint, 1934 Report of Committee D-9.

Power Factor and Resistivity of Insulating Materials (Committee D-9).—Development and preparation of test methods for measuring dielectric constant and power factor of liquid insulation and of solid insulating materials. Resistivity methods for liquid and solid insulation adopted, also procedures developed for power factor and dielectric strength of solid insulation at 100 to 1500 kilocycles, 1000 cycles and 25 to 60 cycles. See preprint, 1934 Report of Committee D-9. In connection with this work see papers by W. B. Kouwenhoven and L. W. Marks on "A Comparison of the Methods for Testing Insulating Materials for Power Factor and Dielectric Constant at 1000 Cycles" and by P. H. Dike, W. B. Kouwenhoven and J. B. McCurley on "Methods of Measurement of Dielectric Characteristics at Commercial Frequencies," issued separately.

Tests of Mica Products (Committee D-9).—Study of methods covering mica for capacitor manufacture and built-up pasted mica for general insulating purposes. Tentative methods prepared for grading natural mica and tests for pasted mica, see preprint, 1934 Report of Committee D-9.

Properties of Electrical Slate (Committees D-9 and D-16).—Study of the properties of slate for use in electrical work. Consideration being given to methods for electrical quality and impact tests. No report available.

Textile Materials

Methods of Testing Cotton (Committee D-13).—Based upon fundamental research of cotton fiber quality such as that of the cotton fiber laboratories of the U. S. Bureau of Agricultural Economics, on studies of length, strength, fineness, maturity and color of raw cotton, work will be undertaken on specifications and suitable methods of measurement. See preprint, 1934 Report of Committee D-13.

Tests of Rayon Fabrics (Committee D-13).—Studies of tension test for wet specimens, cloth fraying test, washability or launderability test; also methods to determine pulling at seams, slippage of fabrics, and oil and moisture contents of oiled rayons. Not yet reported upon.

Tests of Silk Textiles (Committee D-13).—Studies of methods of examination and classification of broad silks, determining metallic weighting and water-soluble finishing materials. Also twist and take-up tests. Not yet reported upon.

Shrinkage, Tear Resistance and Thickness Tests of Textile Fabrics (Committee D-13).—As covered by title. Test adopted for shrinkage in laundering of woven cotton cloth. Procedures for tear resistance and elongation developed, see preprint, 1934 Report of Committee D-13.

Moisture Regain of Textiles and Methods of Measuring Relative Humidity (Committee D-13).—Studies of moisture regain of such textile materials as fabrics, yarns, raw cotton, wool and rayon. The effect of moisture on elongation of tire cord being studied. Method adopted for determining relative humidity, see preprint, 1934 Report of Committee D-13.

Magnetic Iron Content of Asbestos (Committee D-13).—Studies are contemplated to determine the amount of magnetic iron in asbestos; also the electrical resistivity of asbestos tapes. See preprint, 1934 Report of Committee D-13.

Sizing Contents of Cotton Tapes and Method of Determining Their Acidity and Alkalinity (Committee D-13).—As covered by title. Additional projects include tests for fastness of dyed fabrics to washing and to light, methods for determining the presence of oxycellulose and hydrocellulose in bleached cotton fabrics, a method for testing the waterproofness of fabrics, and a method of testing detergency. See preprint, 1934 Report of Committee D-13.

Miscellaneous Subjects

Study of Very Finely Sized Material (Committee E-1).—Development of methods of procedure for particle size determination of particulate substances such as powdered coal, cement, pigments, by means of liquid elutriation and direct microscopic observation using filar micrometer. Cooperative test program under way for preparing count method of particle size measurement. Microscopic method of particle size determination developed, see *Proceedings*, Vol. 33, Part I, p. 989 (1933). See also preprint of paper by H. H. Hatch on "The Importance and the Determination of Particle Sizes of Hydraulic-Fill Dam Materials."

A General Study of Methods of Determining Consistency and Plasticity (Committee E-1).—The committee is cooperating with various agencies in the development of suitable standards for viscosity and study of various apparatus and methods. Definitions of "consistency" and "plasticity" developed. Study now under way of softening point (ring-and-ball method) test for improving the procedure and to make it generally applicable. Not yet reported upon.